Drug Formulary

For Community Based

Healthcare Facilities

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Drug Formulary

April, 2018

An initiative of

Community Development Medicinal Unit

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Shramajibi Swasthya Udyog

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This document has been developed by a working group constituted by

Community Development Medicinal Unit
&
Shramajibi Swasthya Udyog

taking help from

- National Formulary of India, 2016
- British National Formulary, September 2015–March 2016.

It is not an exhaustive drug formulary. It contains information on the drugs which are commonly used in the **primary and secondary health care facilities** of CDMU's member organizations.

As some of the diseases are tackled by the national health programmes (for example, tuberculosis, leprosy, etc.), the drugs used in their management have not been included this formulary. For information on those drugs, the National Formulary should be consulted.

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Health Library and Information
SOPHEA-SOCHARA
Koramangala

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Foreword

It gives me immense pleasure to write an introduction on a volume which is chosen to have published by CDMU. I know this voluntary healthcare organization since its inception. It long journey in the promotion of generic pharmacotherapy under stormy perspectives has put a dent in the society as it mark of activism and services.

Any medicine is a licensed pharmaceutical product which is available in various dosage forms. Drug Formulary is an official publication for dissemination of information on pharmaceutical products. The information includes nomenclature, actions, formulation recipes, average dosage, indications, contradictions and untoward effects commonly termed as adverse reactions. It has been prepared by the multidisciplinary experts, peer reviewed and edited to its present form.

The art of good prescribing depends upon prescriber's knowledge, skill and ethics which is further guided by the regulatory and peer pressure. Whereas, patient's non-adherence to the prescriber's directions are multi-factorial that includes complicated regimen,unpleasant formulation, adverse effects, disability, cultural practices and the cost of medicines. Present day practice is to build up a concordance between the prescriber and the patient to enhance the rationality in clinical practice. The role of diet and non-pharmacological measures [life-style] are no less important. An ideal Formulary should have a mention on these aspects including guidelines towards problem-based therapeutics [extremes of ages, pregnancy, lactation or co-morbid conditions].

A formulary is an authoritative, independent guidebook on best practices with clinically validated drug information

that enables the health caregivers towards selecting the most safe, appropriate and effective medications on individual perspectives. The present Formulary has been prepared by an Expert Committee comprising of clinicians, pharmacologists and health administrators to cater the needs of its users. Its simple and logical representation on therapeutic aspects of essential and emergency medicines shall be useful to all concerned. The potential users of the document are the healthcare professionals engaged in prescribing, monitoring, supplying and administering medicines for various purposes.

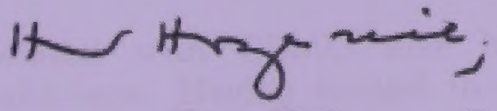
To conclude, all nomenclatures used in this formulary are in agreement with international non-proprietary names [INN] and every information furnished are evidence-based. The present Formulary appears to be unique by its contents and get-up which has created it as an user-friendly document. I firmly believe that this document would be fruitful utilized by all its potential users.

Prof. Krishnangshu Ray
Director
Institute of Health & Family Welfare
Government of West Bengal

Message

I am very pleased and most impressed with the new CDMU Drug Formulary. This publication follows a long tradition of dedicated and practical support to quality prescribing and community development.

I warmly recommend the publication to all medical officers, clinical officers, nurses, other health workers and patients. Independent and reliable medicine information is key to quality prescribing and responsible medicine use by health workers and patients.



Hans V Hogerzeil,
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Professor of Global Health and the Right to Health
University Medical Centre Groningen, The Netherlands

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Message

I am much impressed by the commitment and endurance of the CDMU and partner organizations in West Bengal and warmly commend the excellent work you are involved in. This newly developed CDMU Drug Formulary is a critical resource for primary health care providers offering user-friendly and reliable information, and advice on the properties and use of essential medicines. While much effort is rightly put into strengthening supply chains, the responsible use of medicines at the interface between health worker and patient is all too often neglected. A handy and practical tool such as the new CDMU Drug Formulary together with training of providers at community level will lead to better therapy and health outcomes, and less waste of resources. All for the benefit of patients and the community as a whole.

I am honored to be associated with CDMU and its determination to improve health care. Having worked in a street clinic in Kolkata years ago, I have seen the unnecessary waste and irresponsible use of medicines in the face of utter poverty and need.

On behalf of the Swiss Tropical and Public Health Institute I wish you continued success in your professional activities and human compassion to improve access to effective, safe and high quality medicines for all in West Bengal.

Sincerely

Dr. Karin A. Wiedenmayer,
MSc, PharmD
Project leader
Senior Pharmaceutical and Public Health Specialist
Swiss Tropical and Public Health Institute

Message

The Drug Formulary for community-based health care facilities developed and written by Dr. Punyabrata Gun, Dr. Mrinmoy Bera, Sushanta Roy & Duniya Gangopadhyay is a fantastic achievement for which all involved parties should feel very proud.

Standardising drug prescribing between facilities for common conditions should lead to better patient outcomes, reduced inappropriate use of medicines, more economic use of medicines and in the case of antibiotics less pressure causing resistance. Patients should be at the centre of all prescribing and this formulary provides lots of advice on the appropriate medication for specific conditions and how the medications should be administered.

The formulary goes beyond a simple list of drugs including not only treatment protocols but also covers important pharmacological and pharmacodynamics aspects of using the individual medications along with important interactions. As such the formulary is not only a reference but will prove a useful learning tool which should be required reading for all involved in treating patients in community facilities.

Yours Sincerely

Dr Martin Dedicoat
Consultant Physician in Infectious diseases
& Honorary Associate professor University of Warwick
Clinical TB Lead for Birmingham
Heart of England
NHS Foundation Trust

Message

Congratulations CDMU for preparing such an excellent and worthy resource. The formulary will go a long way in promoting rational use of medicines and support standardization of treatment in health institutions. This will lead to better patient outcomes as it has been produced based on available best evidence of clinical and cost effectiveness. Other envisioned benefits will include reduction of health care costs associated with irrational use of medicines and waste of resources through procurement of various medicines in the same classes, duplication and procurement of unnecessary expensive medicines.

I would challenge my fellow health practitioners to utilize this resource as the realization of benefits primarily better patient outcomes will only be realized if it used.

Wishing you the very best,

Mirfin M Mpundu
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Executive Director
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General advice to prescribers

Rational approach to therapeutics

Medicines should be prescribed only when they are necessary. Always the benefit of administering the medicine should be considered in relation to the risk involved. This is very important during pregnancy, when the risk to both mother and fetus should be considered. It is important to discuss treatment options carefully with the patient so that the patient is content to take the medicine as prescribed. Particularly, the patient should be helped to distinguish between the adverse effects of drugs from the effects of the medical disorder he is suffering. When the beneficial effects of the medicine are likely to be delayed, the patient should be told of that.

The following steps will help prescribers to follow the rational approach to therapeutics.

a) Define the patient's problem

Whenever possible, making the right diagnosis is based on a **detailed history, physical examination, diagnostic tests**. This will help in rational prescribing.

b) Specify the objective of the treatment

Prescribers must clearly state their **treatment objectives** based on the patho-physiology underlying the clinical situation. Very often physicians are required to select more than one therapeutic goal for each patient.

c) Selecting therapeutic strategies

The selected strategy should be agreed with the patient. The selected treatment can be **non-pharma-cological and/ or pharmacological**; it also needs to take into account the **total cost** of all therapeutic options.

i) **Non-pharmacological treatment**: It should always be remembered that the patient does not always need a medicine for treatment of the condition. Very often, health problems can be resolved by a change in lifestyle or diet, use of physiotherapy or exercise, provision of adequate psychological support, and other non-pharmacological treatments, these have the same importance as a prescription medicine, and instructions must be written, explained and monitored in the same way.

ii) **Pharmacological treatment**

d) Selecting the correct group of drugs

Knowledge about the patho-physiology involved in the clinical situation of each patient, pharmacokinetics (what body does to the drug) and pharmaco-dynamics (what drug does to the body) of the chosen group of drugs, are fundamental principles for rational therapeutics.

e) Selecting the medicine from the chosen group

The selection process must consider **benefit/risk/cost information**. This step is based on evidence about maximal clinical benefits of the medicine (**efficacy**) for a given indication with the minimum production of adverse effects (**safety**). It must be remembered that each medicine has adverse effects and it is estimated that up to 10% of hospital admissions in industrialized countries are due to adverse effects. Not all medicine-induced injury can be prevented but much of it is caused by inappropriate selection of drugs.

In cost comparison between drugs, the **cost of the total treatment and not only the unit cost** of the medicine must be considered.

f) Verifying the suitability of the chosen pharmaceutical treatment for each patient

The prescriber must check whether the *active substance chosen, its dosage form, standard dosage schedule and standard duration of treatment* are suitable for each patient. Medicine treatment should be *individualized* to the needs of each patient.

g) Prescription writing

The prescription is the link between the prescriber, the pharmacist (or dispenser) and the patient so that it is important for the successful management of the presenting medical condition.

Prescriptions should be written legibly in ink or otherwise so as to be indelible, should be dated, should state the name and address of the patient, the name, address and medical council registration number of the prescriber, an indication of the type of prescriber and should be signed in ink by the prescriber.

The age and the date of birth of the patient should preferably be stated.

Wherever appropriate the prescriber should state the current weight of the child to enable the dose prescribed to be checked.

The following should be noted:

- The strength or quantity to be contained in capsules, lozenges, tablets etc. should be stated by the prescriber. In particular, strength of liquid preparations should be clearly stated (e.g. 125 mg/5 ml).
- The unnecessary use of decimal points should be avoided, e.g. 3 mg, not 3.0 mg. Quantities of 1 gram or more should be written as 1 g etc. Quantities less than 1 gram should be written in milligrams, e.g. 500 mg, not 0.5 g. Quantities less than 1 mg should be written in micrograms, e.g. 100 micrograms, not 0.1 mg. When decimals are unavoidable a zero should be written in front of the decimal point, if there is no other figure, e.g. 0.5 ml, not .5 ml. Use of the decimal point is acceptable to express a range, e.g. 0.5 to 1 g.
- 'Micrograms' and 'nanograms' should not be abbreviated. Similarly 'units' should not be abbreviated.
- The term 'millilitre' (ml) is used in medicine and

pharmacy and cubic centimeter, c.c., cm2 should not be used.

- Dose and their frequency should be stated. In the case of preparations to be taken 'as required' a minimum dose interval should be specified.
- Care should be taken to ensure children receive the correct dose of the active drug. Therefore, the dose should normally be stated in terms of the mass of the active drug (e.g. '125 mg 3 times daily'); terms such as '5 ml' or '1 tablet' should be avoided except for compound preparations.
- The names of drugs and preparations should be written clearly and not abbreviated using approved titles only.
- The quantity to be supplied may be stated by indicating the number of days of treatment required.
- Although directions should preferably be in English without abbreviation, it is recognized that some Latin abbreviations are used.

A sample prescription used by several member organizations of CDMU has been given in the appendix. It contains the identification data of the patient, chief complaints, history of present illness, history of past illnesses, treatment history, family history, personal history, history of drug and other allergies, general and systemic examination findings, investigations advised, non-medicinal and medicinal advice.

h) Giving information, instructions and warnings

This step is important to ensure patient compliance.

i) Monitoring treatment

Evaluation of the follow up and the outcome of treatment allow the stopping of it (if the patient's problem is solved) or to reformulate it when necessary. This step gives rise to important information about the effects of drugs contributing to building up the body of knowledge of

pharmacovigilance (overall systematic scientific watch on a drug used in the community), needed to promote the rational use of drugs.

Factors affecting medicine response

1. Variation in dose

Success and effectiveness of medicine therapy depends not only on the correct choice of medicine but also on the correct dose regimen. Unfortunately, treatment frequently fails because either the dose is too small or it is too large that it produces adverse effects amongst other factors. The concept of a standard or 'average' adult dose for every medicine is firmly rooted in the mind of most prescribers. After the initial 'dose ranging studies on new drugs', manufacturers recommend a dosage that appears to produce the desired response in the majority of subjects. These studies are usually done on healthy, young male volunteers, rather than on older men and women with illnesses and of different ethnic and environmental backgrounds. The use of standard doses in the marketing literature suggests that standard responses are the rule, but in reality there is considerable variation in medicine response. There are many reasons for this variation such as medicine formulation (the form in which it is available, like tablets, syrups, injections etc.), body weight and age, variation in pharmacokinetics (absorption, distribution, metabolism and excretion), variation in pharmacodynamics, disease variables, environmental and genetic variables, adherence to instructions and adverse effects and interactions (Drug-Drug Interaction, Food-Drug Interaction, etc.)

2. Formulation

The type of drug formulation is an important factor affecting its response, apart from its lipid solubility and so many other factors. Pharmaceutical dosage forms such as tablets, capsules, emulsions, ointments, injectables, etc provide a mechanism for safe, effective, accurate, and convenient

delivery of drugs to the target site. Poorly formulated drugs may fail to disintegrate or dissolve. Enteric-coated drugs are particularly problematic, and have been known to pass through the gastrointestinal tract intact. Some drugs like digoxin or phenytoin have a track record of formulation problems, and dissolution profiles can vary not only from manufacturer to manufacturer but also from batch to batch manufactured by the same manufacturer.

3. Body weight and age

Although the concept of varying the dose with the body weight or age of children has a long tradition, adult doses have been assumed to be the same irrespective of size or shape. Yet adult weights vary two to threefold, while a large fat mass can store large excess of highly lipid soluble drugs compared to lean patients of the same weight. Age changes are also important.

Adolescents may oxidize some drugs relatively more rapidly than adults, while the elderly may have reduced renal function and eliminate some drugs more slowly.

4. Sex

Females usually require smaller doses than males. Iron preparations and other haematinics are exceptions to this rule because of the blood lost by women during menstruation. There is a possibility that males metabolize benzodiazepines, estrogen containing preparations and salicylate at a faster rate than females.

5. Route of administration

It governs the **speed and intensity, rapidity and duration of drug response**. The indications for a drug may vary when route of administration varies.

Example: Magnesium sulphate: when administered orally—acts as a purgative, topically—decreases swelling on sprained joints, and still when administered intravenously—CNS depression and hypotension.

6. Tolerance

The therapeutic effects of some medicines are lessened in individuals over a prolonged period of use. Thus, a patient who has been using a drug for longer time period requires a higher dose so as to obtain the same therapeutic effect produced by the drug when taken for the first time. This is called tolerance. Opioids, benzodiazepines, α_2 agonists, caffeine, cocaine, amphetamines, and barbiturates fall into this category. Cross-tolerance develops when the use of one drug causes a tolerance to another (having some structural resemblance). Alcoholics, barbiturate and narcotic addicts develop a cross-tolerance to sedatives and anaesthetics. These individuals require very large amounts of anaesthetics before surgical anaesthesia can be attained.

7. Synergistic effect

Several drugs when combined may show synergistic action in the form of either additive or supra-additive action or potentiation (or commonly expressed as, when 1 +1 = >2). A few examples are:

- Trimethoprim + Sulphamethoxazole (Cotrimoxazole).
- ACE inhibitor / Angiotensin Receptor blocker + Diuretic.
- Long acting β2 agonists + Inhaled steroids (Example— Salmeterol + Fluticasone)

8. Resistance

Development of resistance to drugs is a common problem with antimicrobial agents (anti-tuberculosis drugs, anti-leprotic drugs, anti-malarial drugs etc). Rational prescribing and strict compliance by the user will prevent the emergence of resistance.

9. Pharmacokinetic variables

In a short it is what the body does to the drug while administered.

a). ***Absorption of medicines:*** is possible when it is present

in a form soluble in water. Medicine absorption rates may vary widely between individuals and in the same individual at different times and in different physiological states as it is dependent on many factors like fine particles, the rapidity in which it is dispersed and many others. It is usual that "Acidic drugs are better absorbed in acidic media and basic drugs are absorbed better in alkaline media". Drugs taken after a meal are delivered to the small intestine much more slowly than in the fasting state, leading to much lower medicine concentration. In pregnancy gastric emptying is delayed, while some drugs may increase or decrease gastric emptying and affect absorption of other drugs.

b) ***Distribution of medicines:*** varies widely, fat soluble drugs are stored in adipose (fatty) tissue, water soluble drugs are distributed chiefly in the extracellular space, acidic drugs bind strongly to plasma protein albumin and basic drugs to muscle cells. Hence variation in plasma albumin levels, fat content or muscle mass may all contribute to dose variation. With very highly albumin bound drugs like warfarin, a small change of albumin concentration can produce a big change in free medicine concentration and a dramatic change in therapeutic action of a medicine.

c) ***Medicine metabolism:*** rates are determined both by genetic and environmental factors. Medicine acetylation shows genetic polymorphism, whereby individuals fall clearly into either fast or slow acetylator types. Medicine oxidation, however, is polygenic, and only a small proportion of the population can be classified as very slow oxidizers of some drugs (like Primaquine, Dapsone, etc.) and much of the variation is under environmental control.

d) ***Medicine excretion:*** many are eliminated by the kidneys without being metabolized. Renal disease or competitive tubular secretion of drugs can therefore slow down the excretion of certain drugs.

10. Pharmacodynamic variables

In a short it is what drug does to the body. There is significant variation in receptor response to some drugs, especially central nervous system responses, for example pain and sedation. Some of this is genetic, some due to tolerance, some due to interactions with other drugs and some due to addiction, for example, morphine and alcohol.

10.1. Disease variables

Both liver and kidney disease can have major effects on medicine response, chiefly by the inhibitory effect on metabolism and elimination respectively (increasing toxicity), but also by their effect on plasma albumin (increased free medicine also increasing toxicity). Heart failure can affect metabolism of drugs with rapid hepatic clearance (for example lidocaine, propranolol). Respiratory disease and hypothyroidism can impair medicine oxidation thus retarding its metabolism and increase free level in plasma and causing toxicity.

10.2. Environmental factors and genetic factors (Pharmacogenetics)

Many drugs and environmental toxins can influence liver leading to more rapid metabolism and elimination and ineffective treatment. Environmental pollutants, carcinogens, tobacco smoke, alcohol, anaesthetic drugs and pesticides can also induce metabolism, thus ineffective treatment. Diet and nutritional status also have an impact on pharmacokinetics. For example, in infantile malnutrition and in malnourished elderly populations medicine oxidation rates are decreased, while high protein diets, charcoal cooked foods and certain other foods act as metabolizing enzyme inducers. Sedative and hypnotics induce sleep better in calm environment and when administered at night. Pharmacogenetic variation will affect the medicine response, by 4-6 folds among different individuals. Some other factors in certain cases may result in toxicity, for example toxicity caused by inhibitory effect of isoniazid on

phenytoin metabolism seems to be more significant higher in slow acetylators of isoniazid than in those patients who metabolize the drug more rapidly.

11. Adherence (Compliance) with medicine treatment

Difficulties in adherence to drug treatment occur in all ages. There are several factors contributing to poor compliance with prescribed medicines:

a) The prescription may *not be collected or not dispensed.*

b) The purpose of medicine may not be *clear to the patient.*

c) The patient may perceive that the medicine/s is/are not effective.

d) There may be real or perceived adverse effects.

e) The patients' perception of the risk and severity of side-effects may differ from that of the prescriber.

f) The instructions for administrations may not be clear.

g) There may be difficulty in taking medicines—to swallow the medicine, to handle small tablets, or to open medicine containers may be difficult.

h) The formulation may be unattractive, e.g. unpleasant taste.

i) The regimen may be complicated.

12. Adverse effects and interactions

Adverse Drug Reactions (ADR) is unwanted or unintended effects of a medicine, which occur during its proper use. They differ from accidental to deliberate excessive dosage or medicine maladministration. ADRs may be directly linked to the properties of the medicine in use, the so-called 'A' type reactions. An example is hypoglycaemia induced by an antidiabetic medicine. ADRs may also be unrelated to the known pharmacology of the medicine, the 'B' type reactions including allergic effects, for example anaphylaxis with

penicillins. Thalidomide marked the first recognized public health disaster related to the introduction of a new medicine. It is now recognized that clinical trials, however thorough, cannot be guaranteed to detect all adverse effects likely to be caused by a medicine and hence necessitating post-marketing surveillance.

12.1. Major factors predisposing to adverse effects

It is well known that different patients often respond differently to a given treatment regimen. For example, in a sample of 2422 patients who had been taking combinations of drugs known to interact, only 7 (0.3%) showed any clinical evidence of interactions. Therefore, in addition to the pharmaceutical properties of the medicine, the characteristics of the patients may be responsible for causing predisposition to ADRs.

12.2. Extremes of age

The very old and the very young persons are more susceptible to ADRs. Drugs which commonly cause problems in the elderly include hypnotics, diuretics, non-steroidal anti-inflammatory drugs, anti-hypertensives, psychotropics, digoxin etc.

All children, and particularly neonates, differ from adult in their response to drugs. Some drugs are likely to cause problems in neonates (for example morphine), but are generally tolerated in children. Valproic acid is associated with increased risk of ADRs in children of all ages. Other drugs associated with problems in children include chloramphenicol (grey baby syndrome), antiarrhythmics (worsening of arrhythmias), acetylsalicylic acid (Reye's syndrome etc).

12.3. Intercurrent Illness

If besides the condition being treated the patient concomitantly suffers from another disease, such as kidney, liver or heart disease, special precautions may be necessary to prevent ADRs. Remember also that, apart from the above

factors, the genetic make-up of the individual patient may also predispose to ADRs.

12.4. Drug interactions

Interactions may occur between drugs which compete for the same receptor or act on the same physiological system. They may also occur indirectly when a medicine-induced disease or a change in fluid or electrolyte balance alters the response to another medicine. When two drugs are administered to a patient, they may either act independent of each other, or interact with each other. Interactions may increase or decrease the effects of the drugs concerned and may cause unexpected toxicity besides in some special conditions of some therapeutic advantage. These may occur when one medicine alters the absorption, distribution, metabolism or elimination of another medicine, such that the amount which reaches the site of action is increased or decreased. Medicine-medicine interactions are some of the commonest causes of adverse effects. As newer and more potent drugs become available, the number of serious medicine interactions is likely to increase. Remember that interactions which modify the effects of a medicine may involve non-prescription drugs, non-medicinal chemical agents, and social drugs such as alcohol, marijuana, tobacco and traditional remedies, as well as certain types of food. The physiological changes in individual patients, caused by such factors as age and gender, also influence the predisposition to ADRs resulting from medicine interactions.

12.5. Pharmaceutical interactions

Certain drugs, when added to intravenous fluids, may be inactivated by pH changes, by precipitation or by chemical reaction. Benzylpenicillin and ampicillin lose potency after 6-8 hours if added to dextrose solutions, due to the acidity of these solutions. Some drugs bind to plastic containers and tubing, for example diazepam and insulin. Aminoglycosides are incompatible with penicillins and heparin. Hydrocortisone is incompatible with heparin, tetracycline and chloramphenicol.

12.6. Adverse effects caused by traditional drugs

Patients who have been or are taking traditional herbal remedies may develop ADRs. It is not always easy to identify the responsible plant or plant constituent.

12.7. The effect of food on medicine absorption

Food *delays gastric emptying* and reduces the rate of absorption of many drugs, the total amount of medicine absorbed may or may not be reduced. However, some drugs are preferably taken with food, either to increase absorption or to decrease the irritant effect on the stomach.

1. Analgesics, Antipyretics, Non-Steroidal Anti-Inflammatory Drugs [NSAIDS]

ACETYLSALICYLIC ACID / ASPIRIN

Reserved for use in pregnancy, if critical for mother

Uses

Mild to moderate pain such as headache, acute migraine attacks, transient pain of muscles and bones, pain during menstruation and for reducing fever, pain and swelling of rheumatoid arthritis, antiplatelet agent for prevention of myocardial infarction, stable cardiac pain, stroke prevention.

Common available forms:

Tablet
50, 60, 75, 80, 150, 300 and 325 mg.

Dose

Adult: Analgesic and antipyretic including migraine attacks: 0.3 to 0.9g, 3 to 4 times a day (max. 4g daily).

Acute Rheumatic fever: 4 to 6g or 75 to 100 mg/kg daily in divided doses. Antiplatelet: 75-325 mg/day .

Children under 16 years: not recommended (can cause Reye's syndrome).

When not to be used

Active peptic ulceration, bleeding disorders, children under 16 years (risk of Reye's syndrome), haemophilia, previous peptic ulceration (analgesic dose), severe cardiac failure (analgesic dose), ulcerative colitis.

Use with caution

Allergic disease, anaemia, asthma, elderly, G-6-PD-deficiency, preferably avoid during fever or viral infection in children (risk of Reye's syndrome—characterized by acute noninflammatory encephalopathy and fatty degenerative liver failure, typically occurs after a viral illness, particularly an upper respiratory tract infection, influenza, varicella, or gastroenteritis, and is associated with the use of aspirin during the illness), previous peptic ulceration, thyro-toxicosis, uncontrolled hypertension, altered liver function (avoid in severe liver impairment) or kidney function, breast-feeding (short course safe in usual dosage, monitor infant, pregnancy, dehydration, interactions.

DRUG-DRUG INTERACTIONS

Corticosteroids	Increased risk of gastrointestinal bleeding and ulceration, corticosteroids reduce plasma–salicylate concentration
Heparin	Enhanced anticoagulant effect
Methotrexate	Reduced excretion of methotrexate (increased toxicity)
Warfarin	Increased risk of bleeding due to antiplatelet effect

Common side-effects

Blood disorder (with analgesic doses), bronchospasm, confusion (with analgesic doses), bleeding from stomach and intestine, stomach upset, bleeding including bleeding under conjunctiva, increased bleeding time, skin reactions, tinnitus (with analgesic doses), Reye's syndrome, angioedema.

Storage

Store protected from moisture at a temperature not exceeding 30°C.

DICLOFENAC

Should be safe to use in pregnancy.

Uses

Acute musculo-skeletal pain, arthritis, gout, spondylitis, migraine, post-operative pain.

Common available forms

Tablet	Capsule	Injection	Eye / Ear Drop	Suppositories	Gel
25 & 50 mg Plain 75 & 100 mg SR	100 mg, 100 mg CR	3 ml ampoule (25 mg/ml)	0.1% w/v	25, 50 and 100 mg	1% w/w.

Dose

Oral : 100 to 150 mg daily in 2 to 3 divided doses,(max 150 mg/day) maintenance by 50 to 100 mg in divided doses.

Rectal - Post-operative pain: *Adult*:

75 to 150 mg daily in divided doses (max. 150 mg/day, inclusive of diclofenac administered through other routes).

Child: 6 to 12 year: 1 to 2 mg/kg/day in divided doses for max. of 4 days

Intramuscular injection : 75 mg, 2 to 3 times daily.

Topically: ***Adult***- Apply 1% w/w gel on to affected area 3 to 4 times daily.

Instill to eye: *Post-operative ocular inflammation:*In adult as sodium (1% w/v), 4 times daily starting 24 h after surgery for up to 28 days.

When not to be used

Porphyria (any of a group of rare, often inherited disorders caused by accumulation of porphyrins— chemicals formed in the body during the manufacture of haem, a component of haemoglobin), history of gastric ulcers, bleeding or perforation. Should not to be used if other NSAID or anticoagulant is being used, history of bleeding disease, history of confirmed or suspected bleeding in brain,

operations with high risk of bleeding, history of asthma, moderate or severe kidney impairment, hypovolaemia, dehydration.

Use with caution

NSAIDs should be used with caution in the elderly (risk of serious side-effects and fatalities), interactions, pregnancy, patients with coagulation disorders, hepatic, kidney and cardiac impairment, history of gastrointestinal lesions.

DRUG-DRUG INTERACTIONS	
Methotrexate	Increased levels of methotrexate

Common side-effects

Worsening of asthma, increased risk of myocardial infarction and stroke, bleeding from stomach and intestine, injection site reactions, allergic reactions.

Topical use of large amount may result in systemic effects, including allergy and asthma.

Storage

Store protected from light.

IBUPROFEN

Have some risk, used in pregnancy in cases where no alternative is available

Uses

Pain and inflammation in rheumatic disease and other musculoskeletal disorders including arthritis in children, mild to moderate pain including pain during menstruation, head-ache, pain in children, acute migraine attack.

Common available forms

Tablet
200, 400 and 600 mg

Dose

Adult & Child over 12 years - initially 300 to 400 mg 3 to

4 times daily, increase if necessary (max. 2.4g daily), maintenance dose of 0.6 to 1.2g daily may be adequate.
Infant or Child over 3 months - 5-10 mg/kg 3 to 4 times/ day, Maximum daily dose: 40 mg/kg/day.

When not to be used
Peptic ulcer, bleeding from stomach and intestine, history of peptic ulceration or bleeding from stomach and intestine on using NSAID, severe heart failure.

Use with caution
Kidney and liver impairment (avoid in severe liver impairment — increased risk of gastrointestinal bleeding and can also cause fluid retention), preferably avoid if history of peptic ulceration, cardiac disease, elderly, pregnancy, breast-feeding (amount too small to be harmful, short courses safe in usual doses), coagulation defects, allergic disorders, interactions.

DRUG-DRUG INTERACTIONS	
Acetylsalicylic acid	Avoid concurrent administration (increased Side-effects, including gastrointestinal damage), antiplatelet effect of acetylsalicylic acid reduced
Atenolol	Antagonism of hypotensive effect
Ciprofloxacin	Increased risk of convulsions
Corticosteroids	Increased risk of gastrointestinal bleeding and ulceration
Digoxin	Exacerbation of heart failure, reduced GFR, and increased plasma-digoxin concentration
Enalapril	Antagonism of hypotensive effect, increased risk of kidney impairment
Glibenclamide	Enhanced effect of glibenclamide
Hydrochlorothiazide	Risk of nephrotoxicity of ibuprofen increased, antagonism of diuretic effect

Lithium	Reduced excretion of lithium
Methotrexate	Excretion of methotrexate reduced
Nifedipine	Antagonism of hypotensive effect
Warfarin	Anticoagulant effect enhanced

Common side-effects

Disturbances in stomach and intestine including nausea, diarrhoea, dyspepsia and bleeding, allergic reactions, blood disorders, worsening of asthma, headache, dizziness, nervousness, depression, drowsiness, insomnia, vertigo, tinnitus, sensitivity to light, blood in urine, kidney failure, fluid retention (rarely, causing congestive heart failure in elderly), raised blood pressure.

Storage

Store protected from light and moisture.

NIMESULIDE

Not in NLEM 2015 or WHO Essential Medicines List 2015. Should not be used as safer alternatives are available.

PARACETAMOL

Should be safe to use in pregnancy.

Uses

Mild to moderate pain, fever.

Common available forms

Tablet	Syrup/Suspension	Rectal suppository	Injection
250, 500, 650 and 1000 mg Plain, 125 mg DT	125 and 250 mg/ 5 ml	80 and 170 mg	2 ml ampoule 125 mg/ml Intravenous infusion 500 mg and 1g.

Dose

Oral

Adult: 0.5 to 1g every 4 to 6 h (maximum 4g, maximum 2g in alcoholics per day).

Child: for post-immunisation pyrexia, up to 2 months: 60 mg. 3 month to 1 year: 60 to 120mg every 4 to 6 h. 1 to 5 years: 120 to 250 mg every 4 to 6 h. 6 to 12 years: 250 to 500 mg every 4 to 6 h.

Intramuscular injection

Adult: 250 mg every 4 to 6 h or as required.

Intravenous infusion

Adult: 1g every 6 hours, maximum daily dose 4 g.

Child: 15 mg/kg upto 4 times a day, maximum daily dose 60 mg/kg.

Use with caution

Alcohol dependence. BEFORE ADMINISTERING, CHECK WHEN PARACETAMOL WAS LAST ADMINISTERED AND THE TOTAL DOSE OF PARACETAMOL IN LAST 24 HOURS. Chronic alcoholism, chronic dehydration, chronic malnutrition, liver impairment (avoid large doses, toxicity occurs with large doses), impairment of kidney function, breast-feeding (small amount present in milk: short courses safe in usual dosage, monitor infant), pregnancy, over-dosage, interactions, G-6-PD deficiency.

Common side-effects

Rare but rashes, dyspepsia and blood disorders reported.

IMPORTANT: liver damage (and less frequently kidney damage) following overdosage.

Storage

Store protected from light and moisture.

2. Antacids and Antiulcer Drugs

ALUMINIUM HYDROXIDE

Have some risk, used in pregnancy in case where no alternative is available.

Uses

As antacid, when blood phosphate level is high in renal failure.

Common available forms

Tablet / Gel / Suspension / Syrup

Usually as fixed dose combinations with Magnesium Hydroxide.

Dose

Tablet

Adult: Dyspepsia, Gastroesophageal Reflux Disease [GERD]: 1 to 2 tablets chewed 4 times daily and at bedtime. Hyperphosphataemia: 2 to 10g daily in divided doses with meals.

Suspension

Adult: 5 to 10 ml suspension 4 times daily between meals and at bedtime.

Child: 6 to 12 years: 5 ml up to three times daily.

When not to be used

Low blood phosphate level, infants, neonates.

Use with caution

Impaired kidney function and kidney dialysis, liver impairment (avoid in severe liver impairment— can precipitate liver encephalopathy by causing constipation). Antacids containing high amount of sodium to be avoided in patients with fluid retention, constipation, dehydration, fluid restriction, gastrointestinal disorders associated with decreased bowel motility or obstruction, pregnancy,

interactions, oedema, cirrhosis and low sodium diets.

DRUG-DRUG INTERACTIONS—

ANTACIDS (ALUMINIUM HYDROXIDE, MAGNESIUM HYDROXIDE)

Note: Antacids should preferably not be taken at the same time as other drugs since they may impair absorption.

Ciprofloxacin	Reduced absorption of ciprofloxacin
Digoxin	Reduced absorption of digoxin
Isoniazid	Reduced absorption of isoniazid
Phenytoin	Reduced absorption of phenytoin
Rifampicin	Reduced absorption of rifampicin

Antacids should preferably not be taken at the same time as other drugs since they may impair absorption Antacids may damage enteric coating designed to prevent dissolution in the stomach.

Common side-effects

Constipation, intestinal obstruction (large doses), loss of appetite.

Storage

Store protected from moisture at a temperature not exceeding 30° C. Do not freeze gel.

FAMOTIDINE

Should be safe to use in pregnancy, but should be avoided unless potential benefit outweighs risk.

Uses

Duodenal or benign gastric ulcers, GERD, Zollinger-Ellison syndrome .

Common available forms

Tablet

20 & 40 mg

Dose

Oral

Benign gastric and duodenal ulceration

Adult: 40 mg daily at bedtime for 4-8 weeks or 20 mg twice daily. To prevent recurrence of duodenal ulceration: 20 mg at bedtime may be taken.

Gastro-oesophageal reflux disease

Adult: 20 mg twice daily for 6-12 week or up to 40 mg twice daily if there is oesophageal ulceration. Maintenance dose: 20 mg twice daily may be given to prevent recurrence

Child: 1-16 yr: 1-2 mg/kg/day in divided twice daily up to 40 mg twice daily.

Zollinger-Ellison syndrome

Adult: Initially, 20 mg every 6 hr, up to 640 mg daily if necessary.

Child: 1-16 yr: 0.5-1 mg/kg/day up to 40 mg/ day, given once at bedtime or taken twice daily.

Non-ulcer dyspepsia

Adult: 10 mg twice daily.

Heartburn

Adult: 10 mg twice daily.

When not to be used

Allergy to famotidine

Use with caution

Possibility of gastric malignancy should be excluded, impaired kidney function, liver cirrhosis, pregnancy, breast-feeding, children and elderly, interactions.

Common side-effects

Headache, dizziness, constipation, diarrhoea, nausea, vomiting, anorexia, rash, fatigue, gynaecomastia (enlargement of one or two breasts in males) and impotence.

Storage

Store protected from light. Tablets to be stored at room temperature, 15-30°C (59-86°F). Injection to be stored between 2-8°C (36-46°F).

MAGNESIUM HYDROXIDE

Should be safe to use in pregnancy

Uses

Constipation.

In combination with Aluminium Hydroxide in ulcer and non-ulcer dyspepsia, GERD.

Common available forms [in fixed combination with Aluminum Hydroxide]

Tablet	Suspension
310 mg	110 ml and 340 ml (8%)

Dose

Oral

Adult: Dyspepsia, GERD: 5 to 10 ml repeated according to patient's needs.

Constipation: 30—45 ml. as required, dose to be given mixed with water at bedtime.

When not to be used

Acute gastro-intestinal conditions, severe kidney impairment.

Use with caution

Kidney impairment, liver impairment (avoid in hepatic coma if risk of kidney failure), interactions (see Aluminium Hydroxide), abdominal pain.

Common side-effects

Diarrhoea, allergic reaction.

Storage

Store protected from light. Do not store gel in refrigerator.

OMEPRAZOLE

Have some risk, used in pregnancy in cases where no alternative is available.

Uses

Benign gastric and duodenal ulcers, Zollinger-Ellison syndrome, to reduce gastric acid secretion during gastric

surgery, GERD, NSAID-induced ulcer, to prevent peptic ulceration during NSAIDs treatment in patients with high risk for peptic ulceration, eradication of H.pylori, as preoperative medication and in patients not responding to H_2 blockers.

Common available forms

Capsule	Injection
20 and 40 mg	10 ml vial (40 mg/10 ml)

Dose

Oral

Benign gastric and duodenal ulcers: 20 mg once a day for 4 weeks in duodenal ulcers, for 8 weeks in gastric ulcers, Increase to 40 mg in severe case.

Maintenance for recurrent duodenal ulcers: 20 mg once daily.

Prevention of relapse: 10 mg daily.

NSAIDs associated gastric or duodenal ulcers or gastro-duodenal erosions: 20 mg daily for 4 weeks.

Prophylaxis in case of history associated with gastric/ duodenal ulcers or dyspepsia: 20 mg daily.

Zollinger-Ellison syndrome: 60 mg to 120 mg/day or more, into divided doses.

Gastric acid reduction during gastric surgery: 40 mg on preceding evening then 40 mg 2 to 6 h before surgery.

When not to be used

Hypersensitivity.

Use with caution

Interactions, pregnancy, concomitant gastric malignancy.

Side-effects

Agitation, impotence.

Storage

Store protected from light and moisture at a temperature not exceeding 30°C.

PANTOPRAZOLE & RABEPRAZOLE
are similar to OMEPRAZOLE

RANITIDINE

Should be safe to use in pregnancy.

Uses

Benign gastric and duodenal ulceration, GERD, gastric and duodenal ulceration from NSAID use, to prevent peptic ulceration from NSAID use, to reduce gastric acid secretion (to prevent acid aspiration) in obstetrics and surgical procedures, to prevent stress ulceration.

Common available forms

Tablet	Syrup	Injection
150 and 300 mg	75 mg/5 ml	2 ml ampoule (25 mg/ml)

Dose

Oral

Adult- Benign gastric and duodenal ulceration: 150 mg twice daily or 300 mg at night for 4 to 8 weeks.

Chronic episodic dyspepsia:150 mg twice daily or 300 mg at night up to 6 weeks.

NSAID-associated ulceration: 150 mg twice daily or 300 mg at night up to 8 weeks (in duodenal ulcer 300 mg can be given twice daily for 4 weeks to achieve a higher healing rate).

Prophylaxis of NSAID-induced duodenal ulcer: 150 mg twice daily.

Reflux oesophagitis: 150 mg twice daily or 300 mg at night for up to 8 weeks, or if necessary 12 weeks (moderate to severe, 150 mg 4 times daily for up to 12 weeks).

Long-term treatment of healed oesophagitis: Adult - 150 mg twice daily.

Gastric acid reduction (to prevent acid aspiration) in obstetrics: 150 mg at onset of labour, then every 6 h.

Surgical procedures: 150 mg 2 h before induction of anaesthesia and also, when possible on the preceding evening.

Intramuscular injection

Adult: Gastric acid reduction in surgical procedures: 50 mg 45 to 60 min before induction of anaesthesia.

Conditions where reduction of gastric acidity is beneficial and oral route not available:50 mg every 6-8 hours.

Slow intravenous injection

Adult Gastric acid reduction in surgical procedures: 50 mg diluted to 20 ml and given over at least 2 min, may be repeated every 6 to 8 hours.

To prevent stress ulceration: 50 mg diluted to 20 ml and given over at least 2 min. (150 mg twice daily, may be given when oral feeding commences.)

Conditions where reduction of gastric acidity is beneficial and oral route not available: 50 mg diluted to 20 ml and given over at least 2 min, may be repeated every 6 to 8 hours.

When not to be used

Porphyria.

Use with caution

Liver impairment (reduce dose, increased risk of confusion), kidney impairment, breast-feeding (significant amount present in milk, but not known to be harmful), middle-aged or older patients and those whose symptoms change-may mask gastric cancer, interactions, pregnancy.

Side-effects

Blurred vision, alopecia (loss of hair), interstitial nephritis, involuntary movement disorders, pancreatitis.

Storage

Store protected from light and moisture.

3. Antiallergics and Drugs used in Anaphylaxis

ADRENALINE (EPINEPHRINE)

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Severe anaphylactic reaction, severe angioedema, cardiac arrest, hemostatic agent.

Common available forms

Injection

1 ml ampoule (1 mg/ml).

Dose

Intramuscular injection

Anaphylaxis: preferable site is the midpoint in anterior thigh [1:1000 solution]. This route should be used by specialists only with extreme care

Slow intravenous injection

When there is doubt regarding adequacy of circulation and absorption from the intramuscular site, slow intravenous injection of 1:10000 (10 mg/ml) solution be injected in severely ill patients only.

When not to be used

Narrow angle glaucoma, organic brain damage, cardiac dilatation, coronary insufficiency.

Use with caution

Hyperthyroidism, hypertension, diabetes mellitus, heart disease, arrhythmias, cerebrovascular disease, second stage of labour, elderly, interactions, pregnancy, breast-feeding .

Common side-effects

Tachycardia and arrhythmias, hypertension, tremor,

anxiety, sweating, nausea, vomiting, weakness, hyperglycaemia, dizziness, pulmonary oedema have all been reported, headache common.

Storage

Store protected from light preferably in containers filled with nitrogen.

CHLORPHENIRAMINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Symptomatic relief of allergy, allergic rhinitis (hay fever), conjunctivitis, urticaria, insect stings and pruritus of allergic origin, adjunct in the emergency treatment of anaphylactic shock and severe angioedema.

Common available forms

Tablet
4 mg

Dose

Oral

Adult- Allergic reactions: 4 mg every 4 to 6 h (max. 24 mg daily).

Child-1 to 2 years: 1 mg twice daily.2 to 5 years: 1 mg every 4 to 6 h (max. 12 mg daily).

6 to 12 years: 2 mg every 4 to 6 h (max. 12 mg daily)

When not to be used

Prostatic enlargement, urinary retention, ileus or pyloroduodenal obstruction, asthma, child under 1 year, hypersensitivity, narrow angle glaucoma, pregnancy, breastfeeding.

Use with caution

Performing works requiring utmost alertness such as vehicle

driving, operating machines etc within 24 h of taking the drug should be avoided. Breast-feeding (safe in usual dosage, monitor infant for drowsiness), kidney and liver impairment (avoid, may cause inappropriate sedation), epilepsy, interactions, atropic gastritis, elderly.

Common side-effects

Drowsiness (rarely, paradoxical stimulation with high doses, or in children or elderly), hypotension, headache, palpitations, psychomotor impairment, urinary retention, dry mouth, blurred vision, gastrointestinal disturbances, liver dys-function, blood disorders, also rash and photosensitivity reactions, hypersensitivity reactions (including bronchospasm, angioedema, anaphylaxis), sweating and tremor, injections may be irritant, flatulence, diarrhoea.

Storage

Store protected from light and moisture.

CINNARIZINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Motion sickness, nausea, vomiting, vertigo and tinnitus associated with Meniere disease and other middle ear disorders, as a nootropic drug, adjunct therapy for symptoms of peripheral arterial disease.

Common available forms

Tablet

25 & 75 mg Plain and 75 mg SR

Dose

Oral

Motion sickness: ***Adult*** - 25 mg 2 hr before travel and 15 mg every 8 hr during travel if needed.

Vertigo *Adult* - 25 mg thrice daily.

Child - 5-12 year: half of adult dose.

Peripheral circulatory disorders *Adult* - 75 mg tablets three times daily.

When not to be used

Hypersensitivity, Parkinson's disease, children below 5 years.

Use with caution

Hypotension, patients should not drive or operate machinery, pregnancy, breast-feeding, elderly, children and neonates, interactions.

DRUG-DRUG INTERACTIONS	
CNS depressants	Additive sedation

Side-effects

Drowsiness, rarely skin and hypersensitivity reactions, dry mouth, extrapyramidal symptoms sometimes associated with severe depression, muscular weakness, headache, euphoria, GI upsets, blurred vision, urinary difficulty or retention, constipation and increased gastric reflux, fatigue, hypo-lipidaemic effect.

Storage

Store below 25°C, protected from light.

DEXAMETHASONE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

To suppress inflammation and allergic disorders, in severe croup or mild croup that might cause complications (croup is a viral infection of the throat and wind pipe causing noisy breathing, a hoarse voice and a harsh, barking cough due to swelling of the passage), adjunctive treatment of bacterial meningitis, cerebral oedema, cerebral oedema with

malignancy, local inflammation of joints (by intra-articular injection), local inflammation of soft tissues (by local infiltration). Also used in PALLIATIVE CARE for symptom control of anorexia, obstruction due to tumour, bronchospasm or partial obstruction, nausea and vomiting, headache due to raised intracranial pressure, pain due to nerve compression.

Common available forms

Tablet	Injection
0.5 mg	2 ml vial (4 mg/ ml)

Dose

Oral

Adult: 0.5 to 10 mg daily in divided doses, repeat if necessary.

Child: 0.02 to 0.3 mg/kg in three or four divided doses daily.

Intravenous injection

Adult: 4 to 10 mg every 6 h.

When not to be used

Untreated systemic infection (unless condition life-threatening), administration of live virus vaccines, kidney failure, diabetes mellitus, psychosis, osteoporosis, pregnancy, CHF, tuberculosis, fungal infections of the eye.

Use with caution

Increased susceptibility to and severity of infection, activation or exacerbation of tuberculosis, amoebiasis, strongyloidiasis, risk of severe chickenpox in non-immune patient, avoid exposure to measles, diabetes mellitus, peptic ulcer, hypertension, Use with Caution relating to long-term use of corticosteroids, glaucoma, epilepsy, drug should not be abruptly withdrawn, interactions, breast-feeding (Systemic effects in infant unlikely with maternal dose of *less than equivalent* of prednisolone 40 mg daily, monitor infant's adrenal function with higher doses).

DRUG-DRUG INTERACTIONS	
Acetylsalicylic acid	Increased risk of gastrointestinal bleeding and ulceration, dexamethasone reduces plasma-salicylate concentration
Albendazole	Plasma-albendazole concentration increased
Atenolol	Antagonism of hypotensive effect
Carbamazepine	Accelerated metabolism of dexamethasone (reduced effect)
Digoxin	Increased risk of hypokalaemia
Enalapril	Antagonism of hypotensive effect
Ephedrine	Metabolism of dexamethasone accelerated
Erythromycin	Erythromycin inhibits metabolism of dexamethasone
Furosemide	Antagonism of diuretic effect, increased risk of hypokalaemia
Glibenclamide	Antagonism of hypoglycaemic effect
Glyceryl trinitrate	Antagonism of hypotensive effect
Hydrochlorothiazide	Antagonism of diuretic effect, increased risk of hypokalaemia
Ibuprofen	Increased risk of gastrointestinal bleeding and ulceration
Insulins	Antagonism of hypoglycaemic effect
Isosorbide dinitrate	Antagonism of hypotensive effect
Levonorgestrel	Levonorgestrel increases plasma concentration of dexamethasone
Medroxyprogesterone	Medroxyprogesterone increases plasma concentration of dexamethasone

Metformin	Antagonism of hypoglycaemic effect
Methotrexate	Increased risk of haematological toxicity
Nifedipine	Antagonism of hypotensive effect
Norethisterone	Norethisterone increases plasma concentration of dexamethasone
Phenobarbital	Metabolism of dexamethasone accelerated (reduced effect)
Phenytoin	Metabolism of dexamethasone accelerated (reduced effect)
Propranolol	Antagonism of hypotensive effect
Rifampicin	Accelerated metabolism of dexamethasone (reduced effect)
Salbutamol	Increased risk of hypokalaemia if high doses of dexamethasone given with high doses of salbutamol
Spironolactone	Antagonism of diuretic effect
Theophylline	Increased risk of hypokalaemia
Vaccines, Live	High doses of dexamethasone impair immune response, avoid use of live vaccines
Warfarin	Anticoagulant effect altered

Common side-effects

Nausea, dyspepsia, malaise, hiccups, hypersensitivity reactions including anaphylaxis, perineal irritation after intravenous administration. Side-effects associated with long-term corticosteroid treatment: hyperglycaemia, abdominal distension, angioedema, bradycardia, acne, erythema, Cushing's syndrome, oropharangeal candidiasis, hypothalamic pituitary adrenal axis suppression.

Storage

Store protected from light at a temperature not exceeding 30° C.

HYDROCORTISONE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Thyrotoxic crisis, adrenocortical insufficiency, acute allergic reactions, corticosteroid replacement before surgery, severe inflammatory bowel disease, ulcerative colitis/ proctitis/ proctosigmoiditis, severe acute asthma, local inflammation of joints and soft tissues (by intra-articular injection).

Common Available Forms

Injection	Cream	Ointment
100, 200 and 400 mg/vial, (25 mg/5 ml).	10g (1% w/w)	1%, 2.5% w/w

Dose

Intramuscular injection or slow intravenous injection or intravenous infusion

Adult: 100 mg to 500 mg, 3 to 4 times in 24 h or as required.

Child: Up to 1year: 25 mg. 1 to 5 years: 50 mg

When not to be used

Not relevant to emergency use but for contra-indications relating to long-term use, ulcers.

Use with caution

Not relevant to emergency use but for precaution relating to long-term use, interactions, breast-feeding (systemic effects in infant unlikely with maternal dose of less than equivalent of prednisolone 40 mg daily, monitor infant's adrenal function with higher doses), pregnancy.

Common side-effects

Side-effects associated with long-term corticosteroid treatment, opportunistic infections.

LEVOCETIRIZINE

Not to be used in first three months of pregnancy

Uses

Allergic rhinitis, chronic urticaria.

Common available forms

Tablet	Syrup
5 mg	2.5 mg / 5 mL

Dose

Oral

Rhinitis, chronic urticaria:

Adult & children (>12 years) - 5 mg once daily in the evening.

Children (6-12 yrs) - 2.5 mg once daily.

Children (6 months - 5 yrs) – 1.25 mg once daily.

When not to be used

Hypersensitivity, end-stage kidney disease with creatinine clearance < 10 ml/min. Not recommended for lactating mothers or children below 6 months.

Use with caution

May impair the ability to drive or operate machinery, concurrent use of alcohol or CNS depressant drugs should be avoided, pregnancy, elderly, interactions.

DRUG-DRUG INTERACTIONS	
Alcohol or CNS depressants	Additive sedation
Theophylline	Increases the levels of levocetirizine in blood

Common side-effects

Sleepiness, fatigue, dry mouth, nasopharyngitis have been reported in adults. Fever, cough, nose-bleeding and diarrhoea may occur in children below 12 years

Storage

Store protected from heat, light and moisture at a temperature not exceeding 30° C.

PHENIRAMINE

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Symptomatic relief of allergy, allergic rhinitis, urticaria.

Common Available Forms

Tablet	Syrup	Injection
25 and 50 mg	15 mg/ml.	2 ml ampoule (22.75 mg/ml)

Dose

Oral

Adult - 25 mg, 2 to 3 times a day or 50 mg twice daily.

Intramuscular injection

Adult - 1 to 2 ml twice a day.

Child - 6 months to 3 years: 0.4 to 1 ml once or twice daily.
Over 4 years - 0.8 to 2 ml once or twice daily

When not to be used

Epilepsy, pregnancy, acute asthma, acute porphyria, symptomatic prostatic hypertrophy, neonates and premature infants

Use with caution

Glaucoma, driving or operating machinery, asthma or severe cardiovascular disease, pregnancy, breast-feeding.

Side-effects

Drug abuse, CNS depression, dry mouth, blurred vision, dizziness, excitation in children.

Storage

Store protected from light and moisture.

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PREDNISOLONE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Short-term as well as long term suppression of inflammation in allergic disorders, malignant disease, autoimmune disease, bronchial asthma.

Common available forms

Tablet	Injection	Syrup	Eye Drops
5, 10, 20, 30 and 40 mg	2 ml vial (40 mg/ml).	1 mg/ml and 3 mg/ml	1% w/v

Dose

Oral

Adult and Child - Initially up to 10 to 20 mg daily in divided doses (severe diseases up to 60 mg), preferably after breakfast

Intramuscular injection

Adult and Child - 25 mg to 100 mg once or twice weekly.

When not to be used

Untreated systemic infection, administration of live virus vaccines, hypersensitivity.

Use with caution

Increased susceptibility to and severity of infection, activation or exacerbation of tuberculosis, amoebiasis, strongyloidiasis, avoid exposure to measles, diabetes mellitus, peptic ulcer, hypertension, congestive heart failure, kidney insufficiency, pregnancy, osteoporosis, glaucoma, psychological disorders, interactions, breast-feeding (systemic effects in infant unlikely with maternal dose of less than prednisolone 40 mg daily, monitor infant's adrenal function with higher doses), liver impairment (use with caution, side-effects more common).

DRUG-DRUG INTERACTIONS	
Carbamazepine	Accelerated metabolism of prednisolone (reduced effect)
Phenobarbital	Metabolism of prednisolone accelerated (reduced effect)
Phenytoin	Metabolism of prednisolone accelerated (reduced effect)
Rifampicin	Accelerated metabolism of prednisolone (reduced effect)
Vaccines, Live	High doses of prednisolone impair immune response, avoid use of live vaccines
Warfarin	Anticoagulant effect altered

Common side-effects

Nausea, dyspepsia, malaise, hiccups, hypersensitivity reactions including anaphylaxis,

supraclavicular lump, fragile skin.

Storage

Store protected from light and moisture.

4. Anti-Alzheimer and Anti-Parkinsonism Drugs

4.1 Anti-Alzheimer Drugs

DONEPEZIL

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

For the treatment of mild to moderate Alzheimer's disease

Common available forms

Tablet
5 and 10 mg

Dose

Oral

Adult: Initially 5 mg daily at bedtime. If necessary increase upto 10 mg once daily at bedtime after 4-6 weeks. Maximum dose: 10 mg daily.

When not to be used

Hypersensitivity, severe liver and kidney impairment, pregnancy, breast-feeding, not recommended for children.

Use with caution

Asthma, COPD, sick sinus syndrome, supraventricular conduction abnormalities, susceptibility to peptic ulcers.

Common side-effects

Abnormal dreams, aggression, agitation, loss of appetite, diarrhea, dizziness, fatigue, hallucinations, headache, sleeplessness, muscle cramps, nausea, itching, rash, syncope, urinary incontinence, vomiting.

Storage

Store protected from moisture, at a temperature not exceeding 25^0C.

MEMANTINE

Not to be used in first three months of pregnancy

Uses

Treatment of moderate to severe dementia of Alzheimer's disease.

Common available forms

Tablet	Capsule	Oral solution
5 and 10 mg	10 mg	2 mg/ml

Dose

Oral

Adult: 5 mg once daily, (maximum dose up to 20 mg/day).

When not to be used

Hypersensitivity to memantine.

Use with caution

History of convulsions.

Common side-effects

Constipation, dizziness, drowsiness, respiratory distress, headache, hypertension.

4.2. Anti-Parkinsonism Drugs

LEVODOPA + CARBIDOPA

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

All forms of parkinsonism other than medicine-induced.

Common available forms

Tablet
Levodopa 100 mg + Carbidopa 10 mg, Levodopa 100 mg + Carbidopa 25 mg, Levodopa 200 mg + Carbidopa 50 mg, Levodopa 250 mg + Carbidopa 25 mg.

Dose

Oral

Parkinsonism: Adult: initially 100 mg (with carbidopa 10 mg) twice daily, increased by 100 mg (with carbidopa 10 mg) every few days as necessary, to a max. of 1.5g. Optimum daily dose must be determined for each patient by careful monitoring and be taken after meals.

When not to be used

Concurrent use of monoamine oxidase inhibitors, undiagnosed chin lesion, breast-feeding, psychosis, decompensated endocrine disease, angle-closure glaucoma, confirmed or suspected malignant melanoma.

Use with Caution

Cushing's syndrome, diabetes mellitus, endocrine disorders, history of convulsions, history of myocardial infarction with residual arrhythmia, history of peptic ulcer, hyperthyroidism, osteomalacia, phaeochromocytoma, psychiatric illness (avoid if severe and discontinue if deterioration), severe cardio-vascular disease, severe pulmonary disease, susceptibility to angle-closure glaucoma.

DRUG-DRUG INTERACTIONS

Metoclopramide	Antagonism of effects of levodopa
Ether, Anaesthetic	Risk of arrhythmias
Ferrous salts	Absorption of levodopa may be reduced
Halothane	Risk of arrhythmias
Methyldopa	Enhanced hypotensive effect, antagonism of antiparkinsonian effect
Nifedipine	Enhanced hypotensive effect
Propranolol	Enhanced hypotensive effect
Pyridoxine	Antagonism of levodopa unless carbidopa also given

Common side-effects

Abnormal dreams, loss of appetite, anxiety, arrhythmias, chorea, confusion, dementia, depression, dizziness, drowsiness, dry mouth, dyskinesia, dystonia, euphoria, fatigue, sleeplessness, nausea, palpitations, postural hypotension, psychosis, syncope, taste disturbances, vomiting.

Storage

Store protected from light and moisture.

TRIHEXYPHENIDYL

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

All forms of parkinsonism other than medicine-induced, control of extrapyramidal disorders caused by CNS drugs.

Common available forms

Tablet
2 mg

Dose

Oral

Parkinsonism (if used in combination with levodopa and carbidopa):

Adult: Maintenance 2-6 mg daily in divided doses. Use not recommended because of toxicity in the elderly and the risk of aggravating dementia.

Parkinsonism/Drug-induced extrapyramidal symptoms: ***Adult:*** 1 mg daily, then increased in steps of 2 mg every 3-5 days, adjusted according to response. Maintenance: 5-15 mg daily in 3-4 divided doses. Not recommended for use in Parkinson's disease because of toxicity in the elderly and the risk of aggravating dementia. Maximum: 20 mg per day.

When not to be used

Gastro-intestinal obstruction and myasthenia gravis.

Use with Caution

Cardiovascular disease, hypertension, liable to abuse, psychotic disorders, prostatic hypertrophy, pyrexia, in those susceptible to angle-closure glaucoma and in the elderly. Use with caution in kidney impairment and liver impairment, breast-feeding and interactions.

Common side-effects

Anxiety, blurred vision, confusion, constipation, dizziness, dry mouth, euphoria, hallucinations, impaired memory, nausea, rash, restlessness, tachycardia, urinary retention, vomiting. Angle-closure glaucoma may occur very rarely.

5.Anticonvulsants/Antiepileptics

CARBAMAZEPINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Partial seizures with or without secondary generalisation, trigeminal neuralgia, bipolar disorder.

Common available forms

Tablet	Syrup
100, 200 and 400 mg Plain 100 mg DT [Dispersable Tablet] 200, 300 and 400 mg CR and SR	100 ml (100 mg/5 ml).

Dose

Oral

Adult: Initially 100 or 200 mg 1 to 2 times daily increased slowly to usual dose of 400 mg to 1.2g daily in divided doses. In some cases 1.6 to 2g may be needed. Administer lower initial dose to elderly.

Child: Start with 5 - 10 mg/kg/day in two to three divided doses then gradually increase at weekly intervals to a max. dose of 30-35 mg/kg/day.

When not to be used

Atrioventricular conduction abnormalities, history of bone-marrow depression, porphyria.

Use with caution

Cardiac disease, history of haematological reactions to other drugs, may exacerbate absence or myoclonic seizures, skin reactions, susceptibility to angle-closure glaucoma. Breast-feeding (Continue breast-feeding, side-effects possible,

monitor infant for drowsiness), avoid sudden withdrawal, interactions, pregnancy.

Patients or their caretakers should be told how to recognize signs of blood, liver or skin disorders and advised to seek immediate medical attention if symptoms such as fever, sore throat, rash, mouth ulcers, bruising or bleeding develop. Leukopenia which is severe, progressive and associated with clinical symptoms requires withdrawal (if necessary under cover of suitable alternative). May impair ability to perform skilled tasks, for example operating machinery, driving.

DRUG-DRUG INTERACTIONS

Amitriptyline	Antagonism (convulsive threshold lowered), accelerated metabolism of amitriptyline, reduced plasma concentration, reduced effect antidepressant
Chloroquine	Convulsive threshold occasionally lowered
Corticosteroids	Accelerated metabolism of corticosteroids
Erythromycin	Increased plasma–carbamazepine concentration
Isoniazid	Increased plasma–carbamazepine concentration (also isoniazid hepatotoxicity increased)
Phenytoin	May be enhance toxicity without corresponding increase in antiepileptic effect, plasma concentration of phenytoin often lowered
Progestins	Accelerated metabolism of progestins
Sulfamethoxazole + Trimethoprim	May be enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of carbamazepine often lowered

Valproic acid	Plasma concentration of valproic acid often lowered, plasma concentration of active metabolite of carbamazepine often raised
Warfarin	Accelerated metabolism of warfarin (reduced anticoagulant effect)

Common side-effects

Allergic skin reactions, aplastic anaemia, ataxia, blood disorders, blurring of vision, dermatitis, dizziness, drowsiness, dry mouth, eosinophilia, fatigue, haemolytic anaemia, head-ache, hyponatremia, leucopenia, nausea, oedema, thrombo-cytopenia,unsteadiness, urticaria, vomiting.

Storage

Store protected from light and moisture.

CLONAZEPAM

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

All forms of epilepsy, panic disorder, adjuvant treatment of refractory epilepsy.

Common available forms

Tablet

0.25, 0.5, 1 and 2 mg

Dose

Oral

Adult: Initially 1 mg once daily for 4 nights, dose to be increased over 2-4 weeks, usual dose 4-8 mg daily, adjusted according to response, dose usually taken at night. May be given in 3-4 divided doses, if necessary.

Panic disorder:

Adult: Initial dose 0.25 mg twice daily, usual maintenance dose 1 mg/day, maximum dose 4 mg/day.

Infants & Child: Initial dose 0.01-0.03 mg/kg/day (not to exceed 0.05 mg/kg/day) given in 2-3 divided doses. Maintenance dose 0.1-0.2 mg/kg/day in 3 divided doses .

When not to be used

Coma, current alcohol abuse, current drug abuse, respiratory depression.

Use with caution

Acute porphyrias, airways obstruction, brain damage, cerebellar ataxia, depression, spinal ataxia, suicidal ideation, elderly, pregnancy, breast-feeding (continue breast-feeding, side-effects possible, monitor infant for drowsiness), interactions, avoid sudden withdrawal.

DRUG-DRUG INTERACTIONS	
Carbamazepine	Decreased level of carbamazepine
Ketoconazole	Inhibition of metabolism of clonazepam

Common side-effects

Sedation, dullness, CNS depression, ataxia, bronchial hypersecretion, abnormal eye movement, blood dyscrasias.

DIAZEPAM

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Status epilepticus, emergency management of recurrent seizures, febrile convulsions, seizures associated with poisoning and medicine withdrawal, adjunct in acute alcohol withdrawal, premedication, anxiety disorders, psychosomatic behaviour disorder, spasticity.

Common Available Forms

Tablet	Capsule	Syrup	Injection
2, 5 and 10 mg	10 mg	2 mg/5 ml	2 ml ampoule (5 mg/ml).

Dose

Oral

Muscle spasm due to various causes:

Adult: 2-15 mg daily in divided doses, then increased if necessary to 60 mg daily.

Anxiety

Adult: 2 mg 3 times a day, then increased if necessary to 15-30 mg daily in divided doses. For debilitated patients, use elderly dose.

Elderly: 1 mg 3 times a day, then increased if necessary to 7.5-15 mg daily in divided doses.

Insomnia associated with anxiety

Adult: 5-15 mg daily, to be taken at bedtime.

Injection

Acute muscle spasm By intramuscular injection or by slow intravenous injection

Adult: 10 mg, then 10 mg after 4 hours if required. Intravenous injection to be administered into a large vein at a rate of no more than 5 mg/ minute.

Treatment of status epilepticus and convulsions due to poisoning By intravenous injection

Adult: 10 mg at the rate of 1 ml/min (5 mg) repeated if necessary after 10 min.

Child (under 12 years): 300 to 400 µg/kg, repeated after 10 min if necessary.

When not to be used

Avoid injection containing benzyl alcohol in neonates, chronic psychosis in adults, CNS depression, compromised airway, hyperkinesis, not for use alone to treat depression or anxiety associated with depression in adults, obsessional

states, phobic states, respiratory depression.

Use with caution

Muscle weakness, organic brain damage, parenteral administration (observe closely till full recovery from sedation), personality disorder may increase risk of dependence, pregnancy, breast-feeding (continue breast-feeding, Side-effects possible, monitor infant for drowsiness), reduce dose in elderly or debilitated patients and in liver impairment (avoid if severe), kidney impairment, avoid prolonged use and abrupt withdrawal.

DRUG-DRUG INTERACTIONS	
Atenolol	Enhanced hypotensive effect
Enalapril	Enhanced hypotensive effect
Frusemide	Enhanced hypotensive effect
Glyceryl trinitrate	Enhanced hypotensive effect

Common side-effects

Amnesia, ataxia (in children and the elderly), confusion (in children and the elderly), dependence, drowsiness the next day, lightheadedness the next day, muscle weakness, paradoxical increase in aggression.

Storage

Store protected from light.

GABAPENTIN

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus.

Uses

Add-on drug in resistant partial seizures with or without secondary generalization, rolandic epilepsy-preferred for safety reason, first line in epilepsy patients with liver disease.

Common available forms

Tablet / Capsule

100, 300 and 400 mg.

Dose

Oral

Initially 10 mg/kg/day, increase 10 mg/kg/day to maintenance dose 30-100 mg/kg/day, in three divided doses.

When not to be used

Pregnancy

Use with caution

Diabetes mellitus, elderly, high doses of oral solution in adolescents and adults with low body weight, history of psychotic illness, mixed seizures (including absences).

Common side-effects

Abdominal pain, abnormal reflexes, abnormal thoughts, acne, amnesia, anorexia, anxiety, arthralgia, ataxia, confusion, constipation, convulsions, cough, depression, diarrhea, dizziness, drowsiness, dry mouth, dry throat, dyspepsia, dyspnoea, emotional lability, fever, flatulence, flu syndrome, gingivitis, headache, hostility, hypertension, impotence, increased appetite, insomnia, leucopenia, malaise, movement disorders, myalgia, nausea, nervousness, nystagmus, oedema, paraesthesia, pharyngitis (in adults), pruritus, rash, rhinitis, speech disorder, tremor, twitching, vasodilatation, vertigo, visual disturbances, vomiting, weight gain.

PHENOBARBITONE

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Generalized tonic-clonic seizures, partial seizures, neonatal seizures, febrile convulsions, status epilepticus, sedative, hypnotic, pre-anaesthetic.

Common available forms

Tablet	Injection	Syrup
30 and 60 mg	1 ml ampoule (200 mg/ml)	20 mg/ml.

Dose

Oral

Adult- 60-180 mg daily at night.

Child- 1 month-12 years: 1-1.5 mg/kg twice daily, maintenance dose 2.5-4 mg/kg once/twice daily.

12-18 years: Initially 60-180 mg twice daily, maintenance dose 60-180 mg once daily.

Slow intravenous injection

Status epilepticus: (dilute injection 1 in 10 with water for injections)

Adult - 10 mg/kg at a rate of not more than 100 mg/min (up to max. total dose of 1 g),

Child- 10-20 mg/kg at a rate of not more than 30 mg/min.

When not to be used

Absence seizures, latent porphyria.

Use with caution

Avoid in acute porphyria, children, debilitated, elderly, history of alcohol abuse, history of drug abuse, respiratory depression (avoid if severe).

DRUG-DRUG INTERACTIONS

Amitriptyline	Antagonism of anticonvulsant effect (convulsive threshold lowered), metabolism of amitriptyline accelerated (reduced plasma concentration)
Carbamazepine	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of carbamazepine often lowered
Haloperidol	Antagonism of anticonvulsant effect (convulsive threshold lowered), meta-

	bolism of haloperidol accelerated (reduced plasma concentration)
Phenytoin	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of phenytoin often lowered but may be raised, plasma concentration of phenobarbital often raised
Valproic acid	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of valproic acid often lowered, Phenobarbital concentration often raised
Warfarin	Metabolism of warfarin accelerated (reduced anticoagulant effect)

Common side-effects

Agranulocytosis, allergic skin reactions, ataxia, behavioural disturbances, cholestasis, depression, drowsiness, hallucinations, hepatitis, hyperactivity particularly in the elderly and in children, hypotension, impaired cognition, impaired memory, irritability, lethargy, megaloblastic anaemia (may be treated with folic acid), nystagmus, osteomalacia, paradoxical excitement, respiratory depression, thrombocytopenia.

Storage

Store protected from moisture.

PHENYTOIN

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Generalized tonic-clonic seizures, partial seizures, status epilepticus

Common Available Forms

Tablet	ER-Capsule	Syrup	Injection
50, 100, 150 &300 mg Plain 50, 100 and 300 mg ER	300 mg	25 mg/ml	2 ml ampoule (50 mg/ml)

Dose

Oral

Epilepsy

Adult- Initially 3-4 mg / kg daily in single dose or in divided doses. Alternatively 150 mg – 300 mg daily gradually increased to 600 mg daily if necessary.

Child- Initially 5 mg / kg daily in 2-3 divided doses. Maintenance 4-8 mg/kg daily in 2-3 divided doses. Maximum 300 mg daily

Injection

Status epilepticus:

Adult- (with regular BP and ECG monitoring) 18 mg/kg at rate not exceeding 50 mg/min as loading dose, maintenance dose of about 100 mg should be given thereafter at an interval of 6 to 8 h (dose can be reduced according to weight).

Child- 20 mg/kg at a rate not exceeding 1 mg/kg/min, maintenance dose 4-7 mg/kg/day in 2 divided doses, max dose 300 mg/day.

When not to be used

Porphyria, avoid parenteral use in sinus bradycardia, sino-atrial block, second and third-degree heart block, Stokes-Adams syndrome, pregnancy.

Use with caution

Enteral feeding (interrupt feeding for 2 hours before and after dose, more frequent monitoring may be necessary. With intravenous use: heart failure, hypotension, injection solution alkaline (irritant to tissues), respiratory depression, resuscitation facilities must be available.

Liver impairment (reduce dose to avoid toxicity), breast-

feeding (Small amount present in milk, continue breast-feeding, side-effects possible, monitor infant for drowsiness).

DRUG-DRUG INTERACTIONS	
Amitriptyline	Antagonism (convulsive threshold lowered), reduced plasma amitriptyline concentration
Carbamazepine	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of phenytoin often lowered but may be raised, plasma concentration of carbamazepine often lowered
Chloroquine	Convulsive threshold occasionally lowered
Clonazepam	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of clonazepam often lowered
Fluconazole	Effect of phenytoin enhanced, plasma concentration increased
Haloperidol	Antagonism of anticonvulsant effect (convulsive threshold lowered)
Isoniazid	Metabolism of phenytoin inhibited (enhanced effect)
Metronidazole	Metabolism of phenytoin inhibited (increased plasma-phenytoin concentration)
Rifampicin	Accelerated metabolism of phenytoin (reduced plasma concentration)
Sulfadoxine + Pyrimethamine	Plasma-phenytoin concentration increased, increased antifolate effect
Sulfamethoxazole +Trimethoprim	Antifolate effect and plasma-phenytoin concentration increased

Valproic acid	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of valproic acid often lowered, plasma concentration of phenytoin often raised (but may also be lowered)
Warfarin	Accelerated metabolism of warfarin (Reduced anticoagulant effect, but enhancement also reported)

Common side-effects

Acne, anorexia, coarsening of facial appearance, constipation, dizziness, drowsiness, gingival hypertrophy and tenderness (maintain good oral hygiene), headache, hirsutism, insomnia, nausea, paraesthesia, rash, transient nervousness, tremor, vomiting.

Storage

Store protected from moisture at temperature not exceeding 30° C.

SODIUM VALPROATE

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Generalized tonic-clonic seizures, partial seizures, atonic seizures, absence seizures, myoclonic seizures, acute mania, migraine.

Common available forms

Tablet	Syrup	Injection
125, 200, 250, 300 and 500 mg Plain 200, 300 and 500 mg CR	200 mg/5 ml	100 mg/vial, 5 ml ampoule (100 mg/5 ml)

Dose

Oral

Adult- 600 mg daily in two divided doses (preferably after food) thereafter increase by 200 mg at 3 days interval clinical response till desired.

Child- Initial dose 20 mg/kg/day, max. dose 60 mg/kg/day.

When not to be used

Active liver disease, family history of severe liver dysfunction, pancreatitis, porphyria, hypersensitivity.

Use with caution

Monitor liver function before and during first 6 months of therapy, especially in patients at most risk (children under 3 years of age, those with metabolic disorders, degenerative disorders, organic brain disease or severe seizure disorders associated with mental retardation, or multiple antiepileptic therapy), ensure no undue potential for bleeding before starting and before major surgery or anticoagulant therapy, kidney impairment, pregnancy (neural tube screening), breast-feeding (small amount present in milk, continue breast-feeding, side-effects possible, monitor infant for drowsiness), systemic lupus erythematosus, false-positive urine tests for ketones, avoid sudden withdrawal, interactions, hyper-ammonemia.

DRUG-DRUG INTERACTIONS	
Carbamazepine	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of valproic acid often lowered, plasma concentration of active metabolite of carbamazepine often raised
Chloroquine	Convulsive thresholdoccasionally lowered
Phenobarbital	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of valproic acid often lowered, phenobarbital concentration often raised

Phenytoin	Enhanced toxicity without corresponding increase in antiepileptic effect, plasma concentration of valproic acid often lowered, plasma concentration of phenytoin often raised (but may also be lowered)

Common side-effects

Agression, anemia, confusion, convulsion, deafness, diarrhea, extrapyramidal disorders, gastric irritation, haemorrhage, headache, hyponatremia, memory impairment, menstrual disturbance, nausea, nystagmus, somnolence, stupor, thrombocytopenia, transient hair loss (regrowth may be curly), tremor, weight gain.

Storage

Store protected from light.

6. Laxatives and medicine for Diarrhoea

BISACODYL

Not to be used in first three months of Pregnancy

Uses

Constipation.

Common Available Forms

Tablet	Suppositories
5 mg	5 and 10 mg

Dose

Oral / Rectal

Adult and child over 10 years- 5 to 10 mg daily at night

Before radiological procedure and surgery:16 to 20 mg at night before procedure

When not to be used

Intestinal obstruction (causes abdominal cramps), acute surgical abdominal conditions, acute inflammatory bowel disease, severe dehydration, faecal impaction, chronic use.

Use with caution

Excessive use of stimulant laxatives can cause diarrhoea and related effects such as hypokalaemia, however, prolonged use may be justifiable in some circumstances, don't give antacid within 1 hour, pregnancy, inflammatory bowel disease, pre-existing heart disease or bowel disease

Common side-effects

Allergies, interactions. Tablets- griping, suppositories-local irritation, fainting, dizziness, soreness in anal region due to suppository leakage, abdominal discomfort, electrolyte imbalance, hypokalaemia.

ISPAGHULA

Uses

Constipation, irritable colon syndrome.

Common available forms

Granules (flavoured and sweetened)
37.5 and 100g

Dose

Oral

Adult - 6 teaspoonful in water or milk at night before bed time.

Child - 1-3 teaspoonful in water or milk before be time.

When not to be used

Intestinal obstruction,colonic atony, difficulty in swallowing

Use with caution

Salt restriction, interactions

DRUG-DRUG INTERACTIONS	
Lithium	Decreased effect of lithium

Common side-effects

Abdominal discomfort, flatulence, gastrointestinal obstruction.

Storage

Store protected from light and moisture.

LACTULOSE

Uses

Constipation, hepatic encephalopathy.

Common available forms

Solution / Syrup
3.35g / 5 ml

Dose

Adult/Child - 10 to 20g (15 to 20 ml/day, max 45 ml/day).

When not to be used

Galactosemia, intestinal obstruction, patients on low galactose diet.

Use with caution

Lactose intolerance, diabetes mellitus.

Common side-effects

Diarrhoea(dose related), nausea, vomiting, hypokalaemia, dehydration, hypernatremia, bloating and abdominal cramps.

ORAL REHYDRATION SALTS

Uses

Dehydration from acute diarrhea

Common Available Forms

GLUCOSE SALT SOLUTION 5 & 37.5 g.	
Sodium chloride	2.6 g/litre of water
Sodium citrate	2.9 g/litre of water
Potassium chloride	1.5 g/litre of water
Glucose (anhydrous)	13.5 g/litre of water

When glucose and sodium citrate are not available, they may be replaced by Sucrose (common sugar) 27 g/litre of water and Sodium bicarbonate 2.5 g/litre of water.

In cases of cholera, oral rehydration salts containing a higher concentration of sodium may be required to prevent hyponatraemia.

Note: The solution may be prepared either from prepackaged sugar/salt mixtures or from bulk substances and water. Solutions must be freshly prepared, preferably with recently boiled and cooled water. Accurate weighing and thorough mixing and dissolution of ingredients in the correct volume of clean water is important. Administration of more concentrated solutions can result in hypernatraemia

Dose

Oral

Adult- Fluid and electrolyte loss in acute diarrhoea, 200 to 400 ml solution after every loose motion.

Use with Caution

Kidney impairment.

Common side-effects

Vomiting - may indicate too rapid administration, hypernatraemia and hyperkalaemia may result from overdose in kidney impairment or administration of too concentrated a solution.

Storage

Store protected from moisture in a sachet preferably made of aluminium foil containing sufficient powder for single dose or for a day treatment or for use in hospital.

7. Antidotes and substances used in poisoning

ATROPINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Organophosphate and carbamate poisoning, premedication, antispasmodic, as mydriatic, cycloplegic refraction procedures.

Common available forms

Injection
1 ml ampoules and 50 ml vial (0.6 mg/ml).

Dose

Intramuscular and intravenous injection

Adult- 1.8 - 3.0 mg intravenous bolus followed by doubling dose every 3 to 5 minutesdepending upon response. Endpoint for atropinization include clear chest with no wheeze, systolic BP >80mm Hg, pulse >80 beats/min., pupils no longer pinpoint and dry axillae. Following that infusion of atropine at 10-20 % of total initial dose required/hour, may require boluses during infusion.

Child-20-30 µg/kg initially with same schedule as adult.

When not to be used

In myasthenia gravis (but may be used to decrease muscarinic side-effects of anticholinesterases), paralytic ileus, pyloric stenosis and prostatic enlargement, reflux oesophagitis, unstable cardiac rhythm.

Use with caution

Elderly, Down syndrome, angle-closure glaucoma,

myasthenia gravis, prostatic enlargement, pyrexia, breast-feeding, interactions , pregnancy.

Common side-effects

Constipation, transient bradycardia (followed by tachycardia, palpitation and arrhythmias), reduced bronchial secretions, urinary urgency and retention, dilatation of the pupils with loss of accommodation, photophobia, dry mouth, flushing and dryness of the skin. Occasionally, confusion (particularly in the elderly), nausea, vomiting and giddiness, very rarely, angle-closure glaucoma may occur.

8. Antiemetics

DOMPERIDONE

Uses

Nausea and vomiting from any cause in adult, epigastric senses of fullness, upper abdominal distress, non ulcer dyspepsia, migraine.

Common available forms

Tablet	Syrup	Capsule
5 & 10 mg	30 ml (1mg / mL)	30 mg

Dose

Oral

Adult - 10 to 20 mg 3 to 4 times a day

Child - 0.3 to 0.6 mg/kg 3 times a day

When not to be used

Cardiac disease, conditions where cardiac conduction is or could be impaired in adults, gastro-intestinal haemorrhage in children, if increased gastrointestinal motility harmful in adults, mechanical obstruction in children, mechanical perforation in children, predisposition to cardiac conduction disorders in children, prolactinoma.

Use with caution

Children, if there are cardiac concerns obtain ECG before and during treatment in children, patients over 60 years—increased risk of ventricular arrhythmia in adults

Common side-effects

Drowsiness, dry mouth, malaise, anxiety, breast pain, decreased libido, diarrhea, galactorrhoea, headache, pruritus, rash.

Storage

Store protected from light and moisture.

METOCLOPRAMIDE

Not known to be harmful in pregnancy

Uses

Symptomatic treatment of nausea and vomiting including that associated with acute migraine, delayed (but not acute) chemotherapy-induced nausea and vomiting, radiotherapy-induced nausea and vomiting, prevention of postoperative nausea and vomiting, hiccup in palliative care, nausea and vomiting in palliative care.

Common available forms

Tablet	Syrup	Injection
5 and 10 mg plain 15 mg CR	30 ml (1 mg / ml)	5 mg/ ml 2 ml ampoule and 10 ml vial

Dose

Oral or intramuscular injection or slow intravenous injection

Adult - Nausea and vomiting, gastro-esophageal reflux, gastroparesis: (over 1 to 2 min for slow intravenous injection), 10 mg 3 times daily. 15 to 19 years (under 60 kg) 5 mg 3 times daily. Aid to gastrointestinal intubation: 20 mg as a single dose 5 to 10 min before examination, Adolescent (15 to 19 years), 10 mg.

Child –Up to 1 year (up to 10 kg) 1 mg twice daily,

1 to 3years (10 to 14 kg) 1 mg 2 to 3 times daily,
3 to 5 years (15 to 19 kg) 2 mg 2 to3 times daily,
5 to 9 years (20 to 29 kg) 2.5 mg 3 times daily,
9 to 14 years (30 kg and over) 5 mg 3 times daily (usual max. 500 µg/ kg daily, particularly for children and young adult).

Slow intravenous injection only

Premedication: 10 mg as a single dose.

When not to be used

3-4 days after gastrointestinal surgery, gastrointestinal haemorrhage, gastrointestinal obstruction, gastrointestinal perforation, phaeochromocytoma.

Use with caution

Asthma, atopic allergy, bradycardia, cardiac conduction disturbances, children, elderly, epilepsy, may mask underlying disorders such as cerebral irritation, Parkinson's disease, uncorrected electrolyte imbalance, young adults (15—19 years), liver impairment (reduce dose), kidney impairment, pregnancy, breast-feeding (present in milk, side-effects possible, monitor infant for side-effects), interactions.

Common side-effects

Extrapyramidal effects (especially in children and young adults 15-19 years old), galactorrhoea, gynaecomastia, hyperprolactinaemia, menstrual changes.

Storage

Store protected from light and moisture.

ONDANSETRON

Avoid in pregnancy unless potential benefit outweighs risk.

Uses

Postoperative nausea and vomiting, chemotherapy and/or radiotherapy induced nausea and vomiting.

Common available forms

Tablet	Syrup	Drop	Injection
4 and 8 mg	1 mg/5 ml 2 mg/ 5 ml	2 mg/5 ml	2 and 4 ml ampoule (2 mg/ml)

Dose

Oral

Prevention of post-operative nausea and vomiting:
Adult - 16 mg, 1 h before induction of anaesthesia.

Nausea and vomiting associated with cancer chemotherapy:

Adult- 24 mg as a single dose taken 30 min before start of single day chemotherapy.

Child (4-11 yrs)- 4 mg tablet 3 times a day, continue for 1-2 days after completion of chemotherapy.

Intramuscular or slow intravenous

Parenteral: Post-operative nausea and vomiting:

Adult- 4 mg by i.m or slow i.v as a single dose.

Prevention of chemotherapy-induced nausea and vomiting:

Adult- single 32 mg i.v dose infused over 15 min begining 30 min before start of emetogenic chemotherapy.

When not to be used

Hypersensitivity

Use with caution

Adenotonsillar surgery, subacute intestinal obstruction, susceptibility to QT-interval prolongation (including electrolyte disturbances).

DRUG-DRUG INTERACTIONS	
Tramadol	Decreased effectiveness of tramadol

Common side-effects

Constipation, flushing, headache, injection site-reactions.

PROCHLORPERAZINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Nausea and vomiting, vertigo

Common available forms

Tablet	Injection
5 mg	1 ml ampoule [12.5 mg/ ml]

Dose

Oral

Nausea, vomiting acute attack:

Adult: initially 20 mg then 20 mg every 2 h. Prevention, 5 to 10 mg 2 to 3 times daily.

Child- (over 10 kg only) - Oral: 0.4 mg/kg/day in 3-4 divided doses.

Labyrinthine disorder:

Adult: 5 mg 3 times daily increased to 30 mg daily in divided doses then decrease after meal to 5 to 10 mg daily.

Child: Not recommended.

Injecion

Post-operative nausea and vomiting:

Adult- 4 mg by i.m or slow i.v as a single dose.

Child – 0.13 mg / kg / day in 3 to 4 divided doses, i.v.

Prevention of chemotherapy-induced nausea and vomiting:

Adult- single 32 mg i.v dose infused over 15 min begining 30 min before start of emetogenic chemotherapy.

When not to be used

Avoid oral route in child under 10 kg, children in psychotic disorders, CNS depression, comatose states, phaeochromocytoma.

Use with caution

Elderly, hypotension (more likely after intramuscular injection).

Common side-effects

Dystonic reactions, respiratory depression may occur in susceptible patients.

Storage

Store protected from light and moisture.

PROMETHAZINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Nausea, vomiting, labyrinthine disorders, motion sickness, premedication, allergic rhinitis, vasomotor rhinitis.

Common available forms

Tablet	Syrup	Injection
10 and 25 mg	5mg/5 ml	2 ml ampoule (2 5mg/ml)

Dose

Oral

Nausea and vomiting (including postoperative):

Adult- 12.5 to 25 mg, repeated at intervals of not less than 4 h (usual max., 100 mg in 24 h).

Motion sickness prevention: 20 to 25 mg at bedtime on night before travel, repeated on day of travel if necessary.

Child- Motion sickness, prevention

2 to 5 years: 5 mg at night and on day of travel, if necessary.

5 to 10 years: 10 mg at night and on day of travel, if necessary.

Injection

Nausea and vomiting (including postoperative), (diluted to 2.5 mg/ml in water for injection), 12.5 to 25 mg, repeated at intervals of not less than 4 h (usual max., 100 mg in 24 h).

When not to be used

Many antihistamines should be avoided in acute porphyria, but promethazine is thought to be safe.

Use with caution

Epilepsy, prostatic hypertrophy, pyloroduodenal obstruction, severe coronary artery disease, susceptibility to angle-closure glaucoma, urinary retention.

Side-effects, rare

Anaphylaxis, angioedema, angle-closure glaucoma, arrhythmias, blood disorders, bronchospasm, confusion, convulsions, depression, dizziness, extrapyramidal effects, hypersensitivity reactions, hypotension, liver dysfunction, palpitation, photosensitivity reactions, rashes, sleep disturbances, tremor. With intramuscular use injection pain.

Storage

Store protected from light and moisture.

9. Anti-infectives

9.1 Antiamoebic, Antigiardiasis and Antitrichomoniasis Drugs

DILOXANIDE FUROATE

Should be avoided in pregnancy

Uses

Chronic amoebiasis, acute amoebiasis as adjunct to metronidazole or tinidazole.

Common available forms

Tablet
500 mg

Dose

Oral

Adult: 500 mg every 8 h for 10 days.

Child: 20 mg/kg body weight daily in three divided doses for 10 days.

When not to be used

Breast-feeding, systemic amoebiasis.

Use with caution

Pregnancy (defer treatment until after first trimester).

Common side-effects

Flatulence, pruritus, urticaria, vomiting.

Storage

Store protected from light.

METRONIDAZOLE

High-dose regimens should be avoided, use only if potential benefit outweighs risk.

Uses

Invasive amoebiasis and giardiasis, trichomoniasis, tissue nematode infections, bacterial infections, Helicobacter pylori eradication, ulcerative gingivitis.

Common available forms

Tablet	Suspension	Injection
200 and 400 mg	200 mg/5 ml	500 mg in 100 ml infusion

Dose

Oral

Adult - Amoebiasis: 400 to 800 mg three times a day for 5 to7 days.

Giardiasis: 200 mg three times a day for 7 to 10 days.

Child: 35 to 50 mg/kg body weight in amoebiasis and 10 to 15 mg/kg body weight in giardiasis. Dose to be divided 8 hourly.

Intraveneous

Adult: 500 mg every eight h up to 7 days.

Child: (Below 12 years) 7.5 mg/kg body weight.

When not to be used

Chronic alcohol dependence, neurological disease, blood dyscrasias, first trimester of pregnancy.

Use with caution

Disulfiram-like reaction with alcohol, liver impairment (reduce total daily dose to one third and give once daily in case of severe liver impairment) and hepatic encephalopathy, pregnancy, breast-feeding (significant amount in milk, continue breast-feeding, avoid large doses, use alternative drug if possible), clinical and laboratory monitoring in courses lasting longer than 10 days, interactions, prolonged use may result in fungal or bacterial

superinfection, phenobarbitones, history of seizure disorder.

DRUG-DRUG INTERACTIONS	
Phenytoin	Metabolism of phenytoin inhibited (increased plasma-phenytoin concentration)
Warfarin	Enhanced anticoagulant effect

Common side-effects

Nausea, vomiting, unpleasant metallic taste, furred tongue and gastrointestinal disturbances, rarely, headache, drowsiness, dizziness, ataxia, darkening of urine, erythema multiforme, pruritus, urticaria, angioedema and anaphylaxis, abnormal liver function tests, hepatitis, jaundice, thrombocytopenia, aplastic anaemia, myalgia, arthralgia, peripheral neuropathy, epileptiform seizures, leukopenia on prolonged or high dosage regimens, anorexia, glossitis, dryness of mouth.

Storage

Store protected from light and moisture. Store injection in a single dose container.

TINIDAZOLE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Amoebiasis, trichomoniasis and giardiasis, anaerobic infections, necrotising ulcerative gingivitis, bacterial vaginosis, H. pylori associated peptic ulcers, abdominal surgery prophylaxis.

Common available forms

Tablet	Suspension	Injection
300, 500 mg & 1 g	75 mg/5 ml, 150 mg/5 ml	400 ml infusion (2 mg/ml)

Dose

Anaerobic infections

Oral - ***Adult:*** 2g on first day, followed by 1g daily or 0.5g

twice daily for 5-6 days

Parenteral Bacterial vaginosis and ulcerative gingivitis: Adult- 2g as a single dose parenterally.

Amoebiasis

Oral - *Adult:* 1.5 - 2g daily as a single dose for 3 - 6 days.

Child: 30-50 mg/kg daily as a single dose for 3 days.

Anaerobic infections : *Adult-* Initially 800 mg/400 ml infused i.v. at a rate of 10 ml/minute followed by 800 mg daily.

Trichomoniasis and giardiasis:

Oral - *Adult:* 2g as a single dose.

Child: 50 to 75 mg/kg as a single dose.

Abdominal surgical prophylaxis: *Adult-* 2.0g as single i.v. infusion 12 h prior to surgery.

When not to be used

Hypersensitivity to nitroimidazole derivatives, first trimester of pregnancy, breast-feeding, blood dyscrasias, porphyria, interactions

Use with caution

Seizures, peripheral neuropathy, CNS disease, disulfiram-like reaction with alcohol.

Common side-effects

Similar to metronidazole.

Storage

Store protected from light and moisture.

9.2 Antibacterial Drugs

AMOXYCILLIN

Not to be used in first three months of pregnancy

Uses

Upper respiratory-tract infections, bronchitis, pneumonia,

otitis media, dental abscess, osteo-myelitis, endocarditis prophylaxis, gynaecological infections, gonorrhoea, Helicobacter pylori eradication.

Common available forms

Tablet	Capsule	Dry syrup	Drop	Injection
125 & 250 mg disperasable, 250 mg & 500 mg	250, 500 mg	125 and 250 mg per 5 ml	10 ml (100 mg/ml)	1 ml ampoule (100 mg/ml), 250 mg/vial

Dose

Oral

Adult - 250 mg every 8 h, double in severe infection.

Otitis media: 1g every 8 h.

Enteric fever: 2 to 4g daily in divided doses for 14 to 21 days.

Injection

Intramuscular injection 500 mg every 8 h.

Intravenous injection or infusion 500 mg every 8 h, increase to 1g every 6 h in case of severe infection.

Child up to 10 years- 125 mg every 8 h, double in severe infections.

Otitis media: 40 mg/kg body weight daily in three divided doses.

Enteric fever: 50 to 100 mg/kg body weight in three divided doses for 14 to 21 days.

Intramuscular injection 50 to 100 mg/kg body weight in divided doses.

Intravenous injection or infusion 50 to 100 mg/kg body weight in divided doses.

When not to be used

Hypersensitivity to penicillins

Use with caution

History of allergy, kidney impairment, erythematous rashes common in glandular fever, chronic lymphatic leukaemia and possibly HIV infection, breast-feeding, liver

impairment(Use with caution, monitor liver function, duration of treatment should not exceed 2 weeks).pregnancy.

DRUG-DRUG INTERACTIONS	
Methotrexate	Reduced excretion of methotrexate, increased risk of toxicity

Common side-effects

Nausea and vomiting, diarrhoea, rashes , hypersensitivity reactions (discontinue treatment), haemolytic anaemia, interstitial nephritis (rarely), antibiotic-associated colitis, neutropenia, thrombocytopenia, coagulation disorders (rarely), central nervous system disorders including convulsions associated with high doses or impaired kidney function, mucocutaneous candidiasis with discolouration, agitation.

Storage

Tablet, Capsule and Oral suspension: Store protected from moisture at a temperature not exceeding 30° C.
Injection: Store protected from moisture in a sterile, tamper evident container sealed so as to exclude micro-organisms at temperature not exceeding 30° C.

AMOXYCILLIN + CLAVULINIC ACID

Not to be used in first three months of pregnancy
Uses

Infections due to beta-lactamase-producing strains (where amoxicillin alone not appropriate), including respiratory tract infections, bone and joint infections, genitor-urinary and abdominal infections, cellulitis and animal bites.

Common Available Forms

Tablet	Capsule	Oral suspension	Powder for solution for injection
500 mg+125 mg 250 mg+125 mg 875 mg+125 mg 200 mg+28.5 mg (DT)	500 mg+125 mg 250 mg+125 mg	200 mg+28.5 mg/5 ml 125 mg+31.25 mg/5 ml 250 mg+62.5 mg/5 ml	250 mg + 50 mg 1g + 200 mg 125 mg + 25 mg 500 mg + 100 mg

Dose

Oral

Child 12-17 years: 250/125 mg every 8 hours, increased to 500/125 mg every 8 hours, increased dose used for severe infection.

Adult: 250/125 mg every 8 hour, increased to 500/125 mg every 8 hours, increased dose used for severe infection.

For severe dental infection with spreading cellulitis, dental infection not responding to first-line anti-bacterials

Orally: Child 12-17 years: 250/120 mg every 8 hours for 5 days

Adults: 250/125 mg every 8 hours for 5 days

Intravenous injection or by Intravenous infusion

Adult: 1.2 g every 8 hours, intravenous injections to be administered over 3-4 minutes

With intravenous use in adults: give intermittently in sodium chloride0.9%. Reconstitute 600 mg initially with 10 mL water for injections, then dilute with 50mL infusion fluid, reconstitute 1.2 g initially with 20 mL water for injections, then dilute with 100 mL infusion fluid, give over 30-40 minutes via drip tubing in Sodium chloride 0.9%.

With intravenous use in children: dilute reconstituted solution to a concebtration of 10 mg/mL with Sodium Chloride 0.9%, give intermittently over 30-40 minutes

Surgical prophylaxis

By intravenous injection or by intravenous infusion

Adult: 1.2 g, to be administered up to 30 minutes before the procedure, then 1.2 g every 8 hours for up to 2-3 further doses in high risk procedures

When not to be used

History of amoxicillin+ clavulinic acid-associated jaundice or liver dysfunction, history of penicillin-associated jaundice or liver dysfunction

Precaution

General Caution

Allergy to penicillins, acute lymphocytic leukaemia , chronic lymphocytic leukemia, maintain adequate hydration with high doses (particularly during parental therapy), kidney impairment.

Specific Caution

With intravenous use accumulation of electrolytes contained in parental preparation can occur with high doses.

Cautions & further Information

Cholestatic jaundice can occur either during or shortly after the use of amoxicillin + clavulinic acid. An epidemiological study has shown that the risk of acute liver toxicity was about 6 times greater with amoxicillin + clavulinic acid than with amoxicillin. Cholestatic jaundice is more common in patients above the age of 65 years and in men, these reactions have only rarely been reported in children. Jaundice is usually self-limiting and very rarely fatal. The duration of treatment should be appropriate to the uses and should not usually exeed 14 days.

DRUG-DRUG INTERACTIONS	
Probenecid	Increased concentrations of amoxycillin in serum and bile
Allopurinol	Occurrence of allergic cutaneous reactions
Digoxin	Increased absorption
Warfarin	Increased incidence of bleeding

Common side-effects

Cholestatic jaundice, hepatitis, nausea, vomiting, allergic reactions.

AZITHROMYCIN

Not to be used in first three months of pregnancy

Uses

Prevention of secondary case of invasive group A streptococcal infection in patients who are allergic to penicillin.

Common available forms

Tablet	Oral suspension	Powder for solution for infusion
250 mg & 500 mg	100 mg per 5 ml 200 mg per 5 ml	500 mg

Dose

Oral

Child 6 months-11 years: 12 mg/kg once daily (max. per dose 500 mg) for 5 days

Child 12-17 years: 500 mg once daily for 5 days

Adult: 500 mg once daily for 5 days

Respiratory-tract infections, otitis media, skin and soft-tissue infections

Child 6 months-17 years: 10 mg/kg once daily (max. per dose 500 mg) for 3 days

Child 6 months-17 years (body-weight 15-25 kg): 200 mg once daily for 3 days

Child 6 months-17 years (body-weight 26-35 kg): 300 mg once daily for 3 days

Child 6 months-17 years (body-weight 36-45 kg): 400 mg once daily for 3 days

Child 6 months-17 years (body-weight 46 kg and above):

500 mg once daily for 3 days

Adult: 500 mg once daily, for 3 days, alternatively initially 500 mg once daily for 1 day, then 250 mg once daily for 4 days.

Uncomplicated genital chlamydial infections/ Non-gonococcal urethritis

Child 12-17 years: 1 g for 1 dose

Adult: 1 g for 1 dose

Uncomplicated gonorrhea

Adult: 1 g for 1 dose

Mild to moderate typhoid due to multiple- antibacterial resistant organisms

Adult: 500 mg daily for 7 days

Community-acquired pneumonia, low to moderate severity

Adult: 500 mg once daily for 3 days, alternatively initially 500 mg once daily for 1 day, then 250 mg once daily for 4 days

Antibacterial prophylaxis for insertion of intra-uterine device

Adult: 1 g for 1 dose

Intervenous infusion

Adult: Initially 500 mg once daily for at least 2 days, then (by mouth) 500 mg once daily for a total duration of 7-10 days.

Precaution

Pregnancy, breast feeding, liver impairment (may cause jaundice), kidney impairment.

DRUG-DRUG INTERACTIONS	
Digoxin	Effect of digoxin enhanced.
Warfarin	Enhanced anticoagulant effect of warfarin.

Common side-effects

Anorexia, arthralgia, disturbances in taste, disturbances in vision, dizziness, dyspepsia, flatulence, headache, malaise,

paraesthesia, reversible hearing loss (sometimes with tinnitus) after long-term therapy.

CEPHALEXIN

Not to be used in first three months of Pregnancy

Uses

Susceptible infections due to sensitive Gram-positive and Gram-negative bacteria.

Common available dose

Tablet	Oral suspension
250 mg & 500 mg	40 mg per 1ml

Dose

Oral

Child 1-11 months: 12.5 mg/kg twice daily, alternatively 125 mg twice daily.

Child 1-4 years: 12.5 mg /kg twice daily, alternatively 125 mg/kg 3 times a day.

Child 5-11 years: 12.5 mg/kg twice daily, alternatively 250 mg 3 times a day.

Child 12-17 years: 500 mg 2-3 times a day.

Adult: 250 mg every 6 hours, alternatively 500 mg every 8-12 hours, increased to 1-1.5 g 6-8 hours, increased dose to be used for severe infections.

Serious susceptible infections due to sensitive Gram-positive and Gram-negative bacteria

Child 1 month-11 years: 25 mg/kg 2-4 times a day (max per dose 1 g 4 times a day)

Child 12-17 years: 1-1.5 g 3-4 times a day

Prophylaxis of recurrent urinary-tract infection

Child: 12.5 mg/kg once daily (max. per dose 125 mg), dose to be taken at night

Adult: 125 mg once daily, dose to be taken at night

Use with caution

Kidney impairment

CEFIXIME

Not to be used in first three months of Pregnancy

Uses

Acute infections due to sensitive Gram-negative bacteria

Common available forms

Tablet	Syrup
50 mg, 100 mg & 200 mg	50 mg

Dose

Oral

Child 6-11 months: 75 mg daily

Child 1-4 years: 100 mg daily

Child 5-9 years: 200 mg daily

Child 10-17 years: 200-400 mg daily, alternatively 100-200 mg twice daily

Adult: 200-400 mg daily in 1-2 divided doses

Uncomplicated gonorrhea

Adult: 400 mg for 1 dose

Use with caution

Kidney impairment.

DRUG-DRUG INTERACTIONS	
Carbamazepine	Elevated carbamazepine levels
Anticoagulants	Increased prothrombin time

CEFOTAXIME

Not to be used in first three months of Pregnancy

Uses

Uncomplicated gonorrhea, infection due to sensitive Gram-positive and Gram-negative bacteria, surgical prophylaxis,

haemophilus epiglottis, severe susceptible infections due to sensitive Gram-positive and Gram-negative bacteria, meningitis

Common available forms

Injection

Powder for solution for injection: Cefotaxime 500 mg, 1 gm, 2 gm.

Dose

Injection

Adult: 500 mg for 1dose

Infection due to sensitive Gram-positive and Gram-negative bacteria, Surgical prophylaxis, Haemophilus epiglottitis.

Adult: 1 g every 12 hours

Severe susceptible infections due to sensitive Gram-positive and Gram-negative bacteria, Meningitis

By Adult: 8 g daily in 4 divided doses, increased if necessary to 12 g daily in 3-4 divided doses, intramuscular doses over 1 g should be divided between more than one site

Emergency treatment of suspected bacterial meningitis or meningococcal disease, before urgent transfer to hospital, in patients who cannot given benzyl penicillin (e.g. because of an allergy)

Child 1 month-11 years: 50 mg/kg for 1 dose

Child 12-17 years: 1 g for 1doseAdult: 1 g for 1 dose

Use with caution

Kidney impairment.

Side-effects

Rarely arrhythmias (following rapid injection)

CEFTRIAXONE

Not to be used in first three months of pregnancy

Uses

Surgical prophylaxis, prophylaxis before colorectal surgery, uncomplicated gonorrhea, pelvic inflammatory diseases,

early syphilis, susceptible infections due to sensitive gram-positive and gram-negative bacteria, meningitis, prevention of secondary case of meningococcal meningitis, prevention secondary case of haemophilus influenza type b disease.

Common available forms

Injection

Powder for solution for injection
125 mg powder for solution for injection vial
250 mg powder for solution for injection vial
500 mg powder for solution for injection vial
1 gram powder for solution for injection vial
2 gram powder for solution for infusion vial

Dose

Injection

Surgical prophylaxis: By deep intramuscular injection or by intravenous injection

Adult: 1 g for 1 dose, dose to be administered up to 30 minutes before procedure

Prophylaxis before colorectal surgery

By deep intramuscular injection or by intravenous infusion

Adult: 2 g for 1 dose, dose to be administered up to 30 minutes before procedure, intramuscular doses over 1 g divided between more than one site.

Uncomplicated gonorrhea, Pelvic inflammatory diseases

By deep intramuscular injection

Adult: 500 mg for 1dose

Prevention of secondary case of meningococcal meningitis.

By intramuscular injection

Adult: 250 mg for 1 dose

Prevention of secondary case of Haemophilus influenza type b disease

By intramuscular injection or by intravenous infusion

Adult: 1 g daily for 2 days

Directions for administration for intravenous injection:

- Give over at least 2-4 minutes.
- With intravenous use in children: For intravenous infusion, dilute reconstitution solution with Glucose 5% or 10% or Sodium Chloride 0.9%, give over at least 30 minutes (60 minutes in neonates).
- Not to be given simultaneously with parental nutrition fluids containing calcium, even by different infusion lines, may be infused sequentially with infusion fluids containing calcium if flush with sodium chloride 0.9% between infusion or give infusion by different infusion lines at different sites.

With intramuscular use in children:

- For intramuscular injection ceftriaxone may be mixed with 1% Lidocaine Hydrochloride Injection reduce pain at intramuscular injection site.)

When not to be used

Concomitant treatment with intravenous calcium (including total parental total nutrition containing calcium) in neonates over 41 weeks corrected gestational age—risk of precipitation in urine and lungs. Neonates over 41 weeks corrected gestational age with jaundice, hypoalbuminaemia, acidosis, unconjugated hyperbilirubinaemia, impaired bilirubin binding.

Use with Caution

Dehydration, liver imparment (reduce dose and monitor plasma concentration if there is associated kidney impairment), kidney impairment.

DRUG-DRUG INTERACTIONS	
Warfarin	Enhanced anticoagulant effect

Common side-effects

Calcium certriaxone precipitates in gall bladder—consider discontinuation if symptomatic calcium ceftriaxone precipitates in urine (particularly in very young dehydrated

or those who are immobilized)—consider discontinuation if sympotomatic.

CIPROFLOXACIN

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Gastroenteritis including cholera, shigellosis, travellers' diarrhoea, campylobacter and salmonella enteritis, typhoid, gonorrhoea, chancroid, meningitis (including meningococcal meningitis prophylaxis), respiratory-tract infections including pseudomonal infections in cystic fibrosis, but not pneumococcal pneumonia, urinary-tract infections, bone and joint infections, septicaemia, anthrax, skin infections, prophylaxis in surgery.

Common Available Forms

Tablet	Infusion
250, 500 and 750 mg	2 mg / ml 50 ml 2 mg / ml 100 ml 2 mg / ml 200 ml

Dose

Oral

Adult: Urinary tract infection, respiratory tract infection: 250 to 500 mg, twice daily.

Severe respiratory tract infections: up to 750 mg twice daily (however in acute uncomplicated cystitis in women 100 mg twice daily for three days).

Chronic prostatitis: 500 mg twice daily for 28 days.

Gonorrhoea: 500 mg as a single dose.

Child: Not recommended.

Intravenous infusion [30 to 60 min]

Adult: Urinary tract infection, ENT infection, skin, soft

tissue and bone infection, joint infection, gastrointestinal tract infection, severe systemic infection, gonorrhea, surgical prophylaxis and septicaemia, 100 to 200 mg twice daily by slow intravenous injection or infusion.

When not to be used

History of tendon disorders related to quinolone use, exposure to strong sunlight, hypersensitivity to quinolones derivatives.

Use with caution

Acute myocardial infarction, avoid excessive alkalinity of urine (risk of crystalluria), bradycardia, electrolyte disturbances, ensure adequate fluid intake (risk of crystalluria), heart failure with reduced left ventricular ejection fraction, history of symptomatic arrhythmia, pregnancy, breast-feeding (continue breast-feeding, use alternative drug if possible, high concentrations in breast milk), children or adolescents, avoid exposure to excessive sunlight (discontinue if photosensitivity occurs), tendon damage-discontinue at first sign of pain or inflammation and rest affected limb, liver impairment, kidney impairment.

DRUG-DRUG INTERACTIONS	
Artemether+Lumefantrine	Avoid concomitant use
Glibenclamide	Enhanced effect of glibenclamide
Ibuprofen	Increased risk of convulsions
Warfarin	Enhanced anticoagulant effect

Use In Children

Ciprofloxacin causes arthropathy in the weight-bearing joints of immature animals and is therefore generally not recommended in children and growing adolescents. However, the significance of this effect in humans is uncertain and in some specific circumstances short-term use of ciprofloxacin in children may be justified. Ciprofloxacin is used for pseudo-monal infections in cystic fibrosis (for children over 5 years) and for treatment and prophylaxis of anthrax.

Side-effects

- Common or very common :

  With intravenous use Flatulence, pain at injection site, phlebitis at injection site.

  With oral use Flatulence.

- Rare:

  Abnormal dreams, chest pain, dysphagia, dyspnoea, hot flushes, hyperglycaemia, hypoglycaemia, oedema, pancreatitis, sweating, syncope, tachycardia.

- Very rare:

  Intracranial hypertension, movement disorders, tenosynovitis, tinnitus, vasculitis in children.

Storage

Eye drops and Tablet: Store protected from light.
Injection: Store protected from light at a temperature not exceeding 30° C. The container should not be allowed to freeze.

COTRIMOXAZOLE
(TRIMETHOPRIM + SULPHAMETHOXAZOLE)

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Urinary-tract infections, respiratory-tract infections including bronchitis, pneumonia, infections in cystic fibrosis, otitis media, skin infections.

Common Available Forms

Tablet	Suspension
Trimethoprim + Sulphamethoxazole 20 mg + 100 mg, 80 mg + 400 mg and 160 mg + 800 mg,	Trimethoprim + Sulphamethoxazole 40 mg + 200 mg / 5 ml

Dose
Oral

Adult- 960 mg twice daily

Child- 6 weeks—5 months: 120 mg twice daily, alternatively 24 mg/ kg twice daily.

6 months—5 years: 240 mg twice daily, alternatively 24 mg/ kg twice daily.

6 –11 years: 480 mg twice daily, alternatively 24 mg/ kg twice daily.

12-17 years: 960 mg twice daily.

When not to be used

Hypersensitivity to sulfonamides or trimethoprim, porphyria, marked liver parenchymal damage, blood dyscrasias, severe kidney insufficiency.

Use with Caution

Asthma, avoid in blood disorder, avoid in infants under 6 weeks because of risk of kernicterus, elderly (risk of serious side-effects), G6PD deficiency (risk of haemolytic anaemia), maintain adequate fluid intake, predisposition to folate deficiency, predisposition to hyperkalaemia.

DRUG-DRUG INTERACTIONS	
Methotrexate	Antifolate effect of methotrexate increased (avoid concomitant use)
Phenytoin	Antifolate effect and plasma-phenytoin concentration increased
Sulfadoxine + Pyrimethamine	Increased antifolate effect

Side-effects

Diarrhoea, headache, hyperkalaemia, nausea, rash. Co-trimoxazole is associated with rare but serious side-effects. Discontinue immediately if blood disorders (including leucopenia, thrombocytopenia, megaloblastic anaemia, eosinophilia) or rash (including Stevens-Johnson syndrome, toxic epidermal necrolysis, photosensitivity) develop.

Storage

Store protected from light and moisture. Suspension should not be allowed to freeze.

DOXYCYCLINE

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Respiratory-tract infections, including pneumonia and chronic bronchitis, urinary-tract infections, syphilis, chlamydia, mycoplasma and rickettsia, prostatitis, lymphogranuloma venereum, pelvic inflammatory disease (with metronidazole), Lyme disease, brucellosis (with rifampicin), leptospirosis, scrub typhus and travellers' diarrhoea, psittacosis, cholera, melioidosis, plague, anthrax, Q fever, Treatment of acute malaria caused by P. malariae and susceptible P. falciparum, P. vivax and P. ovale (followed by primaquine to eliminate intraliverforms), prophylaxis of malaria for pregnant women and non-immune individuals at risk.

Common available forms

Capsule / Tablet
100 mg

Dose

Oral

Severe infections including refractory urinary tract infection: 200 mg daily.

Early syphilis: 100 mg twice daily for 14 days.

Latent syphilis: 200 mg twice daily for 28 days.

Uncomplicated genital Chlamydia, non-gonococcal urethritis: 100 mg twice daily for 7 days.

Child- Only if alternate antibacterial cannot be given 5 mg/

kg body weight in two divided doses.

Direction for administration

Capsules and tablets should be swallowed whole with plenty of fluid, while sitting or standing. Capsules should be taken during meals.

When not to be used

Pregnancy, children, porphyria, systemic lupus erythematosus, hypersensitivity to tetracycline.

Use with caution

Alcohol dependence.

DRUG-DRUG INTERACTIONS	
Warfarin	Anticoagulant effect enhanced

Common side-effects

Anorexia, anxiety, dry mouth, flushing, fungal superinfection (when used for periodontitis), tinnitus.

Storage

Store protected from light and moisture at a temperature not exceeding 30° C.

ERYTHROMYCIN

Not to be used in first three months of Pregnancy

Uses

Alternative to penicillin in hypersensitive patients, pneumonia, legionnaires' disease, syphilis, chancroid, chlamydia, non-gonococcal urethritis, prostatitis, lymphogranuloma venereum, campylobacter enteritis, relapsing fever, diphtheria and whooping cough prophylaxis upper respiratory tract infection, acne vulgaris, sycosis, vulgaris.

Common available forms

Tablet	Syrup
125 dispersable, 250 and 500 mg	125 mg/5 ml

Dose

Oral

Adult and child over 8 years: 250 to 500 mg every 6 h or 0.5 to 1g every 12 h upto 4g daily in severe infections.

Child: 1 month to 2 years: 12.5 mg/kg body weight every 6 h, 2 to 8 years 250 mg every 6 h (doses doubled for severe infections).

Early syphilis: 500 mg three times daily for 14 days.

When not to be used

Hypersensitivity to erythromycin or other macrolides, porphyria, myasthenia gravis.

Use with Caution

Avoid in acute porphyria, neonates under 2 weeks, liver impairment [Avoid in severe, May cause idiosyncratic hepatotoxicity] and kidney impairment, prolongation of the QT interval (ventricular tachycardia reported), pregnancy, breast-feeding,

DRUG-DRUG INTERACTION	
Artemether + Lumefantrine	Avoid concomitant use
Carbamazepine	Increased plasma-carbamazepine concentration
Corticosteroids	Inhibits metabolism of corticosteroids
Digoxin	Enhanced effect of digoxin
Warfarin	Enhanced anticoagulant effect

Side-effects

Nausea, vomiting, abdominal discomfort, diarrhoea and antibiotic-associated colitis, urticaria, rashes and other allergic reactions (rarely, anaphylaxis), reversible hearing loss after large doses, cholestatic jaundice, cardiac effects

(including chest pain and arrhythmias), myasthenia-like syndrome, erythema multiforme (Stevens-Johnson syndrome) and toxic epidermal necrolysis, burning sensation, itching, anorexia.

Storage

Store protected from light at a temperature not exceeding 30° C.

GENTAMICIN

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Pneumonia, cholecystitis, peritonitis, septicaemia, acute pyelonephritis, prostatitis, skin infections, pelvic inflammatory disease, endocarditis, meningitis, listeriosis, tularaemia, brucellosis, plague, surgical prophylaxis, ocular bacterial infection.

Common available forms

Eye drop	Cream	Injection
0.3% w/v	15g (0.1% w/w)	2 ml ampoule (40 mg/ml), 2 and 10 ml vials (40 mg/ml)

Dose

Parenteral

Intravenous infusion

Once daily dose regime, 5 to 7 mg/kg body weight, then adjust as per serum gentamicin concentration.

Intramuscular or slow intravenous injection over at least 3 min.

Multiple daily dose regimen: 3 mg/kg body weight divided into 8 hly doses.

Child- 2 weeks to 12 years, 2 mg/kg body weight 8 hly.

When not to be used

Myasthenia gravis

Use with caution

Kidney impairment, infants and elderly (dosage adjustment and monitor kidney, auditory and vestibular function and serum-gentamicin concentrations), avoid prolonged use, conditions characterized by muscular weakness, significant obesity (monitor serum-gentamicin concentration closely and possibly reduce dose), purulent discharge, discontinue if pain/inflammation becomes aggravated, pregnancy, breast-feeding (enters breast milk, use with caution).

DRUG-DRUG INTERACTIONS	
Suxamethonium	Enhanced muscle relaxant effect
Vancomycin	Increased risk of nephrotoxicity and ototoxicity
Vecuronium	Enhanced muscle relaxant effect
Diuretics	Increased risk of ototoxicity

Common side-effects

Vestibular and auditory damage, nephrotoxicity, rash, bacterial/fungal corneal ulcers, ocular burning or irritation.

Storage

Store protected from moisture if it is intended for use in the manufacture of parenteral preparations.

OFLOXACIN

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Acute uncomplicated cystitis, community acquired pneumonia, acute exacerbation of chronic bronchitis.

Common available forms

Tablet	Syrup/ Suspension	Injection	Eye drops
100, 200 and 400 mg	50 mg/5 ml, 100 mg/5 ml— 30 ml and 60 ml bottles	100 ml (2 mg/ml)	0.3% w/v

Dose

Oral

Community acquired pneumonia: ***Adult*** - 400 mg twice daily for 10 days.

Pelvic inflammatory disease: ***Adult*** - 400 mg twice daily for 14 days.

Complicated UTI: ***Adult***- 200 mg twice daily for 10 days.

Parenteral

Complicated UTI: ***Adult*** 200 mg daily by i.v infusion over at least 30 minutes, max. 400 mg twice daily infused over at least 1 h.

Septicaemia, lower respiratory tract infection: ***Adult*** - 200 mg twice daily by i.v infusion over at least 30 minutes, max. 400 mg twice daily infused over at least 1 h.

Ophthalmic

Bacterial corneal ulcer: ***Adult***- 0.3%, 1-2 drops every 30 minutes.

Bacterial conjunctivitis: ***Adult***- 0.3%, 1-2 drops every 2-4 h. Child- >1year, 1-2drops every 2-4 h.

When not to be used

Hypersensitivity

Use with caution

Acute myocardial infarction, bradycardia, electrolyte disturbances, heart failure with reduced left ventricular ejection fraction, history of psychiatric illness, history of symptomatic arrhythmias, liver disease(reduce dose in severe liver impairment), limit alcohol intake, pregnancy, breast-feeding(continue breast-feeding, use alternative drug if possible).

Common side-effects

Cough, eye irritation, nasopharyngitis.

Storage

Tablets: Store protected from light and moisture.
Eye Drops: Store protected from light.

9.3 Antifilarial Drugs

DIETHYLCARBAMAZINE

Not to be used in women who are or may become pregnant

Uses

Wuchereria bancrofti infections, Brugia malayi infections, Loa loa infections.

Common available forms

Tablet	Syrup
50 and 100 mg	5 mg/5 ml and 120 mg/5 ml.

Dose
Oral

Wuchereria bancrofti infections, Brugia malayi infections

Adult and child- Initially 1 mg/ kg daily in divided doses on the first day, then increased to 6 mg/ kg daily in divided doses, dose to be increased gradually over 3 days.

Loa loa infections

Adult and child- Initially 1 mg/ kg daily in divided doses on the first day, then increased to 6 mg/ kg daily in divided doses, dose to be increased gradually over 3 days, maximum 9 mg/ kg per day.

Treatment to be continued for 3-4 weeks.

When not to be used

Pregnancy (delay treatment until after delivery), infants, elderly, debilitated (usually excluded from mass treatment

programme), cardiac disease, hypersensitivity, impaired kidney function.

Use with caution

Kidney impairment, cardiac disorders, other severe acute diseases delay diethylcarbamazine treatment until after recovery, risk of meningoencephalitis in severe infection.

Common side-effects

Headache, dizziness, drowsiness, nausea and vomiting, immunological reactions, within a few hour of the first dose, subsiding by fifth day of treatment and including fever, headache, joint pain, dizziness, anorexia, malaise, nausea and vomiting, urticaria and asthma in asthmatics induced by disintegrating microfilariae, microencephalitis (with heavy microfilaraemia), reversible proteinuria, enlargement of lymph nodes.

Storage

Store protected from moisture.

9.4 Antifungal Drugs

CLOTRIMAZOLE

Minimal absorbtion from skin, not known to be harmful. Still not to be used in first three months of pregnancy

Uses

Vulvo-vaginal candidiasis, trichomoniasis, vaginitis, non-specific vaginitis, mixed vaginal infection, Gram-positive and Gram-negative bacterial infection, infective leucorrhoeas, prevention of athletes foot and ringworm disease of skin folds.

Common Available Forms

Pessaries/Vaginal Tablets	Cream	Powder	Lotion
100, 200 and 500 mg	1% w/w	1% w/w	2% w/w

Dose

Pessaries/Vaginal Tablets

Adult: 100 mg pessary/vaginal tablet to be inserted into vagina at night before going to bed as deep as possible for consecutive 6 to 7 days or 200 mg for 3 consecutive night before going to bed or 500 mg single dose.

Cream

Rub on affected area 2 to 3 times by applying in thin layer, continue for 14 days after healing.

When not to be used

Ophthalmic use, hypersensitivity.

Use with caution

Contact with eyes and mucous membrane should be avoided.

Common side-effects

Local irritation, erythema, hypersensitivity reactions, itching, mild burning sensation. Treatment should be discontinued if side-effects are severe.

Storage

Store protected from light and moisture. Do not crush pessaries.

FLUCONAZOLE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Candidal balanitis, vaginal candidiasis, recurrent vulvovaginal candidiasis, mucosal candidiasis (except genital), tinea pedis, tinea corporis, tinea cruris, pityriasis versicolor, dermal candidiasis, invasive candidal infections (including candidaemia and disseminated candidiasis) and cryptococcal infections (including meningitis), prevention of

fungal infections in immunocompromised patients.

Common available forms

Tablet / Capsule	Eye drop
50, 150, 200 and 400 mg	5 ml (0.3% w/v).

Dose

Oral

Mucosal: 50 to 100 mg daily for 14 to 30 days.

Vaginal: 150 mg as a single dose.

Oral: systemic loading dose of 400 mg on first day and thereafter 200 to 400 mg once daily for at least 28 days.

Prophylaxis of fungal infection: 50 to 100 mg once daily.

When not to be used

Acute porphyria.

Use with caution

Kidney impairment, breast-feeding (present in milk, safe in usual dosage, monitor infant), monitor liver function-discontinue if signs or symptoms of liver disease(risk of liver necrosis), pregnancy, immunocompromised patients.

DRUG-DRUG INTERACTIONS

Artemether + Lumefantrine	Avoid concomitant use
Glibenclamide	Plasma concentration of glibenclamide increased
Rifampicin	Accelerated metabolism of fluconazole
Warfarin	Enhanced anticoagulant effect

Common side-effects

Abdominal discomfort, diarrhea, flatulence, headache, nausea, rash.

Storage

Store in an airtight container.

GRISEOFULVIN

Avoid in pregnancy (fetotoxicity and teratogenecity in animals)

Uses

Dermatophyte infections where topical therapy has failed or is inappropriate, tinea capitis caused by Trichophyton tonsurans.

Common available forms

Tablet
250 mg & 500 mg

Dose
Oral

Adult- 500 mg once a day or in divided doses, in severe infections dose may be doubled. Reduce when response occurs. Administer with meals.

Child- Under 50 kg: 10 mg/kg body weight once daily or divided doses with meals.

When not to be used

Severe liver disease, pregnancy (avoid pregnancy during and for 1 month after treatment), men should not father children within 6 months of treatment, porphyria, systemic lupus erythematosus and related disorders.

Use with caution

Pre-existing liver insufficiency (closely monitor liver function throughout treatment), blood disorders (monitor blood count weekly during first month of treatment), breast-feeding, interactions, avoid exposure to sunlight/ artificial light. May impair ability to perform skilled tasks, for example operating machinery, driving.

DRUG-DRUG INTERACTIONS	
Levonorgestrel	Accelerated metabolism of levonorgestrel (reduced contraceptive effect)
Warfarin	Metabolism of warfarin accelerated (reduced anticoagulant effect)

Common side-effects

Headache, nausea, vomiting, diarrhoea, rashes, dizziness, fatigue reported, dry mouth and angular stomatitis, leukopenia, agranulocytosis, proteinuria reported, photosensitivity, lupus erythematosus, toxic epidermal necrolysis, erythema multiforme, serum sickness, angioedema, peripheral neuropathy, confusion and impaired coordination.

Storage

Store in a well closed container.

KETOCONAZOLE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Malassezia fulliculitis dermatophytosis and chronic conditions which cannot be treated topically, infections resistant to fluconazole, blastomycosis, candidiasis, chromomycosis

Common Available Forms

Tablet	Cream	Solution	Lotion
200 mg	2% and 5% w/w	2% w/v	2% w/v

Dose

Oral

Adult- 200 to 400 mg daily once preferably after food.

Child- (Over 2 years) 3.3 to 6.6 mg/kg body weight once daily after food.

Local application- 3 to 4 times daily, apply thoroughly.

When not to be used

Liver impairment, breast-feeding, concomitant use with cisapride.

Use with Caution

Predisposition to adrenocortical insufficiency, avoid in porphyria, pregnancy, hepatotoxicity. Potentially life-threatening hepatotoxicity reported very rarely,, risk of hepatotoxicity greater if given for longer than 14 days. Monitor liver function before treatment, then on weeks 2 and 4 of treatment, then every month. Avoid or use with caution if abnormal liver function tests (avoid in active liver disease) or if history of hepatotoxicity with other drugs.

Common side-effects

Nausea, vomiting, abdominal pain, pruritus, less commonly diarrhoea, headache, dizziness, drowsiness and rash, very rarely, fatal liver damage, dyspepsia, raised intracranial pressure, adrenocortical insufficiency, erectile dysfunction, menstrual disorders, azoospermia (with high doses), gynaeco-mastia, thrombocytopenia, photophobia and alopecia.

9.5 Anthelminthics

ALBENDAZOLE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Echinococcus multilocularis and E. granulosus infections prior to or not amenable to surgery, neurocysticercosis, nematode infections, filariasis, ascariasis, hookworm infections, strongyloidiasis, enterobiasis, trichuriasis, trichostrongyliasis and capillariasis, cestode infections, tissue nematode infections.

Common available forms

Tablet	Oral suspension
400 mg	200 mg/5 ml

Dose

Oral

Adult and child above 2 years- 400 mg daily as a single dose.

Strongyloidiasis, taeniasis and H. nana infection: 400 mg once daily is given for 3 consecutive days. Hydatid disease: 400 mg twice daily with meals for 28 days (therapy may be repeated after 14 days in three cycles).

Child- 1 to 2 years: 200 mg as a single dose

When not to be used

Pregnancy, adequate measures must be taken for non-hormonal contraceptive during and one month after therapy, hypersensitivity.

Use with caution

Pregnancy, liver impairment, increased intracranial pressure, seizures, monitor blood count and liver function.

DRUG-DRUG INTERACTIONS	
Phenytoin	decrease effect of albendazole

Common side-effects

Gastrointestinal discomfort, headache, side-effects associated with use in cestode infections, reversible alopecia, leucopenia, neurocystecercosis, Steven's Johnson syndrome.

Storage

Store protected from light.

PYRANTEL PAMOATE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Ascariasis, hookworm infections, enterobiasis, trichostrongyliasis, tissue nematode infection.

Common available forms

Tablet	Oral suspension
250 mg	250 mg / 5 ml

Dose

Oral

11 mg/kg (max 1g) in a single dose (given for 2 consecutive days in case of heavy hookworm infestation).

When not to be used

Liver diseases.

Use with caution

Pregnancy, breast-feeding, liver disease (reduce dose), severe malnutrition, anaemia, concurrent administration with piperazine.

Common side-effects

Mild gastrointestinal disturbances, headache, dizziness, drowsiness, insomnia, rash and elevated liver enzymes.

Storage

Store protected from light at temperature not exceeding 30°C.

9.6 Antimalarial Drugs

CHLOROQUINE

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Treatment of acute malaria caused by P. malariae and susceptible P. falciparum, P. vivax and P. ovale (followed by primaquine to eliminate intra-liver forms), prophylaxis of malaria for pregnant women and non-immune individuals at risk, rheumatic disorders.

Common available forms

Tablet	Suspension	Injection
250 and 500 mg	50 mg / ml	10 and 30 ml (40 mg/ml)

Dose

Oral

Adult- Immediately 600 mg, after 6 h 300 mg followed by 300 mg daily for 2 days.

Child- 10 mg/kg body weight followed by 5 mg/kg body weight after 6 h, thereafter once a day for 2 days.

Intramuscular injection

Adult- 10 ml followed by 5 ml after 6 h. Thereafter 5 ml daily for two days.

Child- 5 mg/kg body weight administered every 12 h followed by oral therapy.

When not to be used

Severe haematologic distress or gastrointestinal distress, eye dysfunction, liver disease.

Use with caution

If patient continues to deteriorate after chloroquine-suspect resistance and administer quinine intravenously as emergency measure, liver impairment, kidney impairment, pregnancy (but in malaria, benefit considered to outweigh risk), breast-feeding(for malaria prophylaxis, amount probably too small to be harmful, inadequate for reliable protection against malaria, avoid breast-feeding when used for rheumatic disease), may exacerbate psoriasis, neurological disorders (avoid for prophylaxis if history of epilepsy), may aggravate myasthenia gravis, severe gastrointestinal disorders, G-6-PD deficiency, avoid concurrent therapy with hepatotoxic drugs,

DRUG-DRUG INTERACTIONS

Artemether + Lumefantrine	Increased risk of ventricular arrhythmias.
Carbamazepine	Convulsive threshold occasionally lowered

Digoxin	Plasma-digoxin concentration increased.
Mefloquine	Increased risk of convulsions.
Phenytoin	Convulsive threshold occasionally lowered.
Valproic acid	Convulsive threshold occasionally lowered.

Common side-effects

Headache, gastrointestinal disturbances, also convulsions, visual disturbances (retinopathy associated with long-term, high dose therapy or inappropriate self- medication), depigmentation or loss of hair, rashes, pruritus-may become intolerable, bone-marrow suppression, hypersensitivity reactions such as urticaria and angioedema, atrioventricular block (may be result of inappropriate self-medication), porphyria and psoriasis in susceptible individuals.

Storage

Store protected from light.

PRIMAQUINE

Uses

Radical cure of P. vivax and P. ovale malaria (after chloroquine therapy to eradicate erythrocytic forms), elimination of gametocytes of P. Falciparum, malaria prophylaxis.

Common Available Forms

Tablet

2.5, 7.5 and 15 mg

Dose

Oral

Radical treatment

Adult- 15 mg daily for 14 days, may be increased to higher dose.

Child- 250 µg/kg daily for 14 days.

Malaria prophylaxis

Adult- 30 mg once daily

Child- 0.5 mg/kg once daily (to be started 1-2 days before travel and continue for 7 days after departure from malaria endemic area).

When not to be used

Hypersensitivity, granulocytopenia, pregnancy, breast-feeding, children below 1 year.

Use with caution

Patients with history of granulocytosis/ methaemoglobinaemia, G-6-PD deficiency, monitor Hb levels, blood counts routinely and withdraw if signs of haemolysis or methaemoglobinaemia occur, breast-feeding.

Common side-effects

Nausea, vomiting, abdominal cramps, haemolytic anaemia in G-6-PD deficient patients, rarely, leukopenia, agranulocytosis, leukocytosis, methaemoglobinaemia and cardiac arrythmias.

Storage

Store protected from moisture.

QUININE

High doses are teratogenic in first trimester, but in malaria benefit of treatment outweighs risk.

Uses

Multiple drug resistant P. falciparum malaria.

Common Available Forms

Tablet	Suspension	Injection
150 & 300 mg	150 mg / 5 mL	1 and 2 ml ampoule (300 mg/ml).

Dose

Oral

Adult- 300 to 600 mg every 8 h for 5 to 7 days.

Child- 10 mg/kg body weight every 8 h for 5 to 7days.

Intravenous infusion for patients unable to swallow tablets

Loading dose 900 mg to 1.4g infused over 4 h, then 300 to 600 mg every 8 h infused over 4 h.

When not to be used

Haemoglobinuria, myasthenia gravis, optic neuritis, tinnitus, quinine resistant falciparum malaira, pregnancy, breast-feeding.

Use with caution

Atrial fibrillation, cardiac disease, conduction defects, elderly, G-6-PD deficiency , heart block, kidney impairment, interactions.

Common side-effects

Agitation, tinnitus, abdominal pain, acute renal failure, angiooedema, blood disorders, cardiovascular effects, cinchonism, confusion, diarrhea, dyspnoea, flushed skin, headache, hearing impairment, hot skin, hypersensitivity reactions, hypoglycaemia (especially after parenteral administration), intravascular coagulation, muscle weakness, nausea, photosensitivity, rashes, temporary blindness, thrombocytopenia, vertigo, visual disturbances, vomiting.

Storage

Store protected from light.

SULFADOXINE + PYRIMETHAMINE

Have some risk, used in cases where no alternative is available

Uses

Adjunct to quinine in treatment of P. falciparum malaria, malaria prophylaxis.

Common Available Forms

Tablet	Suspension
Sulfadoxine 500mg+Pyrimethamine 25 mg	5 ml (500 mg sulfadoxine+25 mg pyrimethamine).

Dose

Oral

Adult-Treatment: 2 tablets in single dose.

Prophylaxis: one tablet once a week.

Child- Treatment : Under 4 years: half a tablet.

4 to 8 years: one tablet.

9 to 14 years: two tablets single dose.

Prophylaxis: Under 4 years 1/4th tablet.

4 to 8 years: half tablet.

9 to 14 years: 3/4th tablet once a week.

When not to be used

Acute porphyria, hypersensitivity to sulfonamides or pyrimethamine, severe liver or kidney impairment (except where no alternative treatment available), blood dyscrasias, neonates, megaloblastic anaemia and folate deficiency.

Use with caution

Asthma, avoid in blood disorders, avoid in infants under 6 weeks, elderly, G6PD deficiency, history of seizures—avoid large loading doses, predisposition to folate deficiency, predisposition to hyperkalaemia.

DRUG-DRUG INTERACTIONS	
Artemether + Lumefantrine	Avoid concomitant use
Glibenclamide	Effect of glibenclamide rarely, enhanced
Methotrexate	Antifolate effect of methotrexate increased, risk of methotrexate toxicity increased
Phenytoin	Plasma-phenytoin concentration increased, increased antifolate effect
Warfarin	Enhanced anticoagulant effect

Common side-effects

Diarrhoea, headache, hyperkalaemia, nausea, rash.

Storage

Store protected from light and moisture.

9.7 Antiviral Drugs

ACYCLOVIR

Not to be used in first three months of pregnancy

Uses

Treatment of primary genital herpes, disseminated Varicella-zoster in immunocompromised patients, Herpes simplex encephalitis, chicken pox.

Common available forms

Tablet	Suspension	Infusion	Ointment	Cream
200, 400 & 800 mg	400 mg / 5 mL	100 ml	5g (3%w/w)	5g (5%w/w)

Dose

Oral

Adult- Non-genital herpes simplex treatment:

200 mg five times daily usually for 5 days, longer if new lesions appear during treatment or if healing is incomplete. 400mg for immunocompromised patients or if absorption is impaired.

Genital herpes simplex treatment:

200 mg 5 times daily for 5 days or 400 mg three times daily for three days. Longer if new lesions appear or healing is incomplete.

Immunocompromised or HIV positive Patients:

400 mg is given five times daily for7 to 10 days during first episode or 400 mg three times a day for 5 to 10 days during recurrent infection.

Herpes simplex prevention of recurrence:

200 mg 4 times daily or 400 mg twice daily reduced to 200 mg two or three times daily interrupted every 6 to 12 months.

Varicella and herpes zoster:

800 mg five times daily for 7 days.

Chicken pox: 800 mg five times daily for 7 to10 days.

Intravenous infusion

Severe initial genital herpes, varicella zoster, Herpes simplex infection: 5 mg/kg body weight every 8 h for five days.

Child-Under 2 years: half dose. Above 2 years:, adult dose.

Varicella and herpes zoster: 20 mg/kg body weight (max. 800 mg) four times daily for 5 days, Under 2 years 200 mg four times daily,

For 2 to 5 years, 400 mg four times daily.

Over 6 years: 800 mg four times daily.

Chicken pox: 20 mg/kg body weight (max 800 mg) four times daily for 5 days.

When not to be used

Hypersensitivity, glaucoma, psychiatric disease, depression.

Use with caution

Elderly, maintain adequate hydration, kidney impairment, breast-feeding(Significant amount in milk after systemic administration, but considered safe to use), pregnancy, paediatrics.

Common side-effects

Abdominal pain, diarrhea, fatigue, headache, nausea, photosensitivity, pruritus, rash, urticaira, vomiting.

Storage

Store tablets protected from light.

For infusion: Store protected from moisture in a sterile tamper evident container sealed so as to exclude micro-organisms at a temperature not exceeding 30°C.

10. Antimigraine Drugs

FLUNARIZINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Prophylaxis of migraine.

Common available forms

Tablet / capsule
5 and 10 mg

Dose

Oral

Adults- 10 mg at night.

Child < 40 kg- 5 mg at night.

When not to be used

Pregnancy, breast-feeding.

Use with caution

Patient may have drowsiness, should not operate hazardous machines.

Common side-effects

Drowsiness, weight gain, depression, gastric pain, dry mouth, insomnia, extrapyramidal side effects.

PROPRANOLOL

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Prophylaxis of migraine.

Common available forms

Tablet

10, 20 & 40 mg

Dose

Oral

Adult- Initially 40 mg 2 to 3 times a day. Maintenance dose 80 to 160 mg daily.

Child- 2-4 mg/kg/day

When not to be used

Asthma or history of obstructive airway disease, uncontrolled heart failure, Prinzmetal angina, marked bradycardia, hypotension, sick sinus syndrome, second- or third-degree atrioventricular block, cardiogenic shock, metabolic acidosis, severe peripheral arterial disease, pheochromocytoma.

Use with caution

First-degree atrioventricular block, kidney impairment, liver disease, pregnancy, breast-feeding, portal hypertension, diabetes mellitus, myasthenia gravis, history of hypersensitivity (increased reaction to allergen, also reduced response to epinephrine (adrenaline), interactions.

Common side-effects

Bradycardia, heart failure, hypotension, conduction disorders, bronchospasm, peripheral vasoconstriction, exacerbation of intermittent claudication and Raynaud phenomenon, gastrointestinal disturbances, fatigue, sleep disturbances including nightmares, rarely, rash, dry eyes (reversible), exacerbation of psoriasis.

Storage

Store protected from light and moisture.

11. Antiseptics and Disinfectants

GENTIAN VIOLET

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Superficial fungal and bacterial infections.

Common available forms

Solution	Tinture
0.5%	0.5%

Dose

Local application

Skin infections: apply 2 or 3 times daily for 2 to 3 days.

When not to be used

Hyper-sensitivity to gentian violet.

Use with caution

External use only, avoid contact with eyes, it can dye skin, pregnancy.

Common side-effects

Redness, swelling, irritation, allergic reaction.

POVIDONE IODINE

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Antiseptic, skin disinfection, mouth wash.

Common available forms

Solution	Ointment
5% w/v in 100 mL & 500 mL	15g (5% w/w)

Dose

Local application

Adult and Child Pre- and post-operative skin disinfection: apply undiluted.

Antiseptic (minor wounds and burns): apply twice daily.

When not to be used

Avoid regular or prolonged use in patients with thyroid disorders or those taking lithium, avoid regular use in neonates, avoid in very low birthweight infants, burn covering large surface area, hypersensitivity to iodine.

Use with caution

Pregnancy, breast-feeding, broken skin, kidney impairment, avoid contact with eyes, neonates. The application of povidone iodine to large wounds or severe burns may produce systemic side-effects such as metabolic acidosis, hypernatraemia, and impairment of kidney function.

Common side-effects

Irritation of skin and mucous membranes, may interfere with thyroid function tests, systemic effects (see under Use with Caution).

Storage

Store protected from light.

12. Cardiovascular Drugs

12.1 Anti-anginal Drugs

ISOSORBIDE-5-MONONITRATE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Prophylaxis and treatment of angina, congestive heart failure.

Common available forms

Tablet	Sustained release tablet	Capsule
10, 20, 40, 50 and 60 mg	50 and 60 mg	30, 40 and 60 mg

Dose

Oral

20 mg 2 to 3 times a day initially, or 40 mg twice daily (max 120 mg daily individual dose).

When not to be used

Hypersensitivity to nitrates, hypotensive conditions and hypovolaemia, hypertrophic cardiomyopathy, aortic stenosis, cardiac tamponade, constrictive pericarditis, mitral stenosis, marked anaemia, glaucoma, obstructive cardiomyopathy, raised intracranial pressure.

Use with caution

Hypothyroidism, malnutrition, hypothermia, head injury, cerebral haemorrhage, gastrointestinal disease, recent history of myocardial infarction, hypoxaemia or other ventilation and perfusion abnormalities, susceptibility to angle-closure glaucoma, avoid abrupt withdrawal, tolerance, severe liver impairment, severe kidney

impairment, pregnancy, breast-feeding,

DRUG-DRUG INTERACTIONS	
Sildenafil	Serious hypotension, MI may be precipitated

Common side-effects

Dizziness, postural hypotension, tachycardia, throbbing headache.

Storage

Store at a temperature not exceeding 30° C.

ISOSORBIDE DINITRATE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Prophylaxis and treatment of angina, heart failure

Common Available Forms

Tablet [sublingual]	Sustained release capsule
5 and 10 mg	20 and 40 mg

Dose

Sublingual

Adult-Angina acute attack: 5 to 10 mg, repeated as required.

Angina prophylaxis: 20- 120 mg daily in divided doses..

When not to be used

Hypersensitivity to nitrates, hypotension, hypovolaemia, myocardial infarction, hypertrophic obstructive cardiomyopathy, aortic stenosis, cardiac tamponade, constrictive pericarditis, mitral stenosis, marked anaemia, head trauma, cerebral haemorrhage, angle-closure glaucoma.

Use with caution

Severe liver or kidney impairment, hypothyroidism, malnutrition, hypothermia, recent history of myocardial

infarction, pregnancy.

Patients taking isosorbide dinitrate for the long-term management of angina may often develop tolerance to the antianginal effect, this can be avoided by giving the second of 2 daily doses of longer-acting oral presentations after an 8-h rather than a 12-h interval, thus ensuring a nitrate-free interval each day.

DRUG-DRUG INTERACTIONS	
Sildenafil	Serious hypotension, MI may be precipited

Common side-effects

Throbbing headache, flushing, dizziness, postural hypotension, tachycardia (paradoxical bradycardia also reported), palpitation, decreased cardiac output, confusion, increased intracranial pressure.

Storage

Store at a temperature not exceeding 30°C.

12.2 Antiarrythmic Drugs

DIGOXIN

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Atrial fibrillation or flutter, heart failure (for patients in sinus rhythm)

Common available forms

Tablet	Injection
0.25 mg	2 ml (0.5 mg/2 ml),

Dose

Oral

Rapid digitalization, for atrial fibrillation or flutter

Adult: 0.75-1.5 mg in divided doses, dose to be given over 24 hours, reduce dose in the elderly.

Maintenance, for atrial fibrillation or flutter

Adult: 125—250 mcg daily, dose according to renal function and initial loading dose, reduce dose in the elderly.

Heart failure (for patients in sinus rhythm)

Adult: 62.5—125 mcg once daily, reduce dose in the elderly.

Intravenous injection

Emergency loading dose for atrial fibrillation or flutter: ***Adult:*** 0.75 to 1 mg to be given over at least 2 hours, then oral maintenance, start on the following day. Reduce dose in the elderly. Emergency loading dose for heart failure:Over at least 2 h: 0.75 to 1 mg.

Note: Infusion dose may need to be reduced if digoxin or other cardiac glycoside given in previous 2 weeks.

When not to be used

Constrictive pericarditis, hypertrophic cardiomyopathy, intermittent complete heart block, myocarditis, second degree AV block, supraventricular arrythmia, ventricular tachy-cardia or fibrillation.

Use with caution

Hypercalcaemia, hypokalaemia, hypomagnesaemia, hypoxia, recent myocardial infarction, severe respiratory disease, sick sinus syndrome, thyroid disease, elderly (reduce dose), kidney impairment, avoid rapid intravenous administration (nausea and risk of arrhythmias), breast-feeding(enters breast milk, use with caution), pregnancy.

DRUG-DRUG INTERACTIONS	
Acetazolamide	Cardiac toxicity of digoxin increased if hypokalaemia occurs
Atenolol	Increased AV block and bradycardia
Corticosteroids	Increased risk of hypokalamia
Frusemide	Cardiac toxicity of digoxin increased if hypokalaemia occurs
Hydrochlorothiazide	Cardiac toxicity of digoxin increased if hypokalaemia occurs

Common side-effects

Arrhythmias, blurred vision, conduction disturbances, diarrhea, dizziness, eosinophilia, nausea, rash, vomiting, yellow vision.

Storage

Tablet: Store protected from light.

Injection: Store protected from light in a single dose container.

Solution: store protected from light at a temperature not exceeding 30^0C.

12.3 Antihypertensive Drugs

AMLODIPINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Angina, hypertension, coronary artery disease.

Common available forms

Tablet
2.5, 5 and 10 mg

Dose

Oral

Angina: Adult- Initially 5 mg once daily, increased if necessary, max. 10 mg once daily.

Hypertension:

Adult- Initially 5 mg once daily, increased if necessary, max. 10 mg once daily. Elderly- Initial dose- 2.5 mg once daily.

When not to be used

Cardiogenic shock, significant aortic stenosis, unstable angina.

Use with Caution

Hypotension, myocardial infarction, impaired kidney function, sick-sinus syndrome, severe ventricular dysfunction, hypertrophic cardiomyopathy, severe aortic stenosis, elderly, children, pregnancy, breast-feeding, liver impairment.

Common side-effects

Abdominal pain, dizziness, fatigue, flushing, headache, nausea, oedema, palpitation, sleep disturbances.

Storage

Store protected from moisture.

ATENOLOL

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Angina and myocardial infarction, arrhythmias, hypertension, migraine prophylaxis.

Common available forms

Tablet
12.5, 25, 50, and 100 mg

Dose

Oral

Hypertension:

Adult-25-50 mg daily, higher doses are rarely necessary.

Angina:

Adult-100 mg in 1-2 divided doses

Arrhythmia:

Adult-50-100 mg daily

Migraine prophylaxis:

Adult-50-200 mg daily in divided doses.

When not to be used

Asthma, cardiogenic shock, hypotension, marked bradycardia, metabolic acidosis, phaeochromocytoma, second-degree AV block, severe peripheral arterial disease, sick sinus syndrome, third-degree AV block, uncontrolled heart failure.

Use with caution

Diabetes, first-degree AV block, history of COPD, myasthenia gravis, portal hypertension, psoriasis, symptoms of hypoglycaemia may be masked, symptoms of thyrotoxicosis may be masked.

DRUG-DRUG	INTERACTIONS
Glibenclamide	Masking of warning signs of hypoglycaemia such as tremor
Insulins	Enhanced hypoglycaemic effect, masking of warning signs of hypoglycaemia such as tremor
Lidocaine	Increased risk of myocardial depression
Nifedipine	Severe hypotension and heart failure occasionally
Verapamil	Asystole, severe hypotension and heart failure

Common side-effects

Gastrointestinal disturbances (nausea, vomiting, diarrhoea, constipation, abdominal cramp), fatigue, cold hands and feet, exacerbation of intermittent claudication and Raynaud's phenomenon, bronchospasm, bradycardia, heart failure, conduction disorders, hypotension, sleep disturbances, including nightmares, depression, confusion, hypoglycaemia or hyperglycaemia, exacerbation of psoriasis, rare reports of rashes and dry eyes (oculomucocutaneous syndrome-reversible on withdrawal).

ENALAPRIL

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Hypertension, heart failure, prevention of symptomatic heart failure in patients with asymptomatic left ventricular dysfunction.

Common available forms

Tablet

2.5, 5 and 10 mg

Dose

Oral

Hypertension:

Adult- initially 5 mg once daily, maintenance upto 20 mg once daily, maximum 40 mg per day.

Heart failure:

Adult- initially 2.5 mg once daily, increased if tolerated to 10-20 mg twice daily, dose to be increased gradually over 2-4 weeks.

Prevention of symptomatic heart failure in patients with asymptomatic left ventricular dysfunction:

Adult- initially 2.5 mg once daily, increased if tolerated to 10-20 mg twice daily, dose to be increased gradually over 2-4 weeks.

When not to be used

Hypersensitivity to ACE inhibitors (including angioedema), renovascular disease, aortic stenosis, pregnancy, breast-feeding .

Use with caution

Concomitant diuretics, first dose hypotension, peripheral vascular disease or generalized atherosclerosis, use with care in patients with history of idiopathic or hereditary angioedema, use with care in patients with hypertrophic

cardiomyopathy, use with care in patients with severe or symptomatic aortic stenosis.

DRUG-DRUG INTERACTIONS	
Acetylsalicylic acid	Antagonism of hypotensive effect, increased risk of kidney impairment
Antacids	Absorption of enalapril reduced
Glibenclamide	Hypoglycaemic effect enhanced
Heparin	Increased risk of hyperkalaemia
Spironolactone	Enhanced hypotensive effect, risk of severe hyperkalaemia

Common side-effects

Asthenia, blurred vision, depression, dyspnoea.

Storage

Store protected from light.

LOSARTAN

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Diabetic nephropathy in type 2 diabetes mellitus, chronic heart failure wher ACE inhibitors are unsuitable or contraindicated, hypertension, hypertension with intravascular volume depletion.

Common available forms

Tablet

25, 50 and 100 mg

Dose

Oral

Hypertension and diabetic nephropathy:

Adult: 50 mg once daily, increased maximum upto 100 mg

daily as single dose or in two divided doses, if needed.

Child: ≥ 6 years, initially 700 µg/kg, increased to a max. of 50 mg once daily, if needed.

Elderly: over 75 years initially 25 mg daily. Maintenance dose 25 to 100 mg orally in 1 to 2 divided doses.

When not to be used
Severe heart failure.

Common side-effects
Vertigo.

Storage
Store protected from light and moisture.

12.5 Antithrombotic Drugs

CLOPIDOGREL

Not to be used in first three months of pregnancy

Uses
Prophylaxis in thromboembolic disorders including myocardial infarction, peripheral arterial disease and stroke, acute coronary syndrome.

Common Available Forms

Tablet
75, 150 and 300 mg

Dose
Oral

Adult: 75 mg once daily.

Unstable angina: loading dose 300 mg followed by 75 mg once daily.

When not to be used
Active bleeding.

Use with caution
Discontinue 7 days before elective surgery if antiplatelet

effect not desirable, patients at risk of increased bleeding from trauma, surgery or other pathological conditions.

DRUG-DRUG	INTERACTIONS
Omeprazole	Plasma concentration of active metabolite of clopidogrel is decreased
NSAIDs	Increased risk of gastrointestinal bleeding

Common side-effects

Abdominal pain, bleeding disorders (including gastro-intestinal and intracranial), diarrhea and dyspnoea.

12.6 Drugs Used in Heart Failure

FRUSEMIDE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Oedema, mild to moderate hypertension.

Common available forms

Tablet	Injection
40 mg	20 mg / mL

Dose

Oral

Oedema:

Adult: Initially 40 mg daily on waking up. Maintenance. 20 to 40 mg daily, may be increased to 80 mg daily or more in resistant oedema: max 600 mg daily in severe cases.

Child: 1 to 3 mg/kg daily (max. 40 mg daily).

Slow intravenous injection

Acute pulmonary oedema:

Adult- 20 to 50 mg, if necessary increase by 20 mg step-by-

step every 2 h, if effective single dose is more than 50 mg, at a rate not exceeding 4 mg/min.

Child- 0.5 to 1.5 mg/kg daily (max. 20 mg daily).

Oliguria (glomerular filtration rate less than 20 ml/min):

Adult- at a rate not exceeding 4 mg/min, initially 250 mg over 1 h. If urine output not satisfactory during the h after first dose, infuse 500 mg over 2 h then, if no satisfactory response is there in an h after second dose, infuse 1g over 4 h.If no response is there after third dose, dialysis is probably necessary.

When not to be used

Kidney failure with anuria, precomatose states associated with liver cirrhosis[Hypokalaemia may precipitate coma (use potassium sparing diuretic to prevent this), Increased risk of hypomagnesaemia in alcoholic cirrhosis], severe sodium and water depletion, hypersensitivity to sulphonamides and furosemide, hypokalaemia, addison's disease, breast-feeding.

Use with caution

Hepatorenal syndrome, hypoproteinaemia may reduce diuretic effect and increase risk of side-effects.

DRUG-DRUG	INTERACTIONS
Artemether + Lumefantrine	Increased risk of ventricular arrhythmias if electrolyte disturbance occurs
Digoxin	Cardiac toxicity of digoxin increased if hypokalaemia occurs
Enalapril	Enhanced hypotensive effect
Glibenclamide	Antagonism of hypoglycaemic effect
Corticosteroids	Antagonism of diuretic effect, increased risk of hypokalaemia
Salbutamol	Increased risk of hypokalaemia with high doses of salbutamol
Streptomycin	Increased risk of ototoxicity

Common side-effects
Gout, intrahepatic cholestasis.

Storage
Store protected from light.

12.7 Lipid Lowering Drugs

ATORVASTATIN

Not to be used in women who are or may become pregnant

Uses
Primary and secondary hypercholesterolemia, prevention of cerebrovascular accidents, primary prevention of coronary heart disease.

Common available forms

Tablet

5, 10, 20, 40 and 80 mg.

Dose
Oral

Adult- 10 mg daily, increased at 4 weeks interval. Max dose 80 mg.

When not to be used
Hypersensitivity, active liver diseases or unexplained persistent elevation of serum transaminase, pregnancy, breast-feeding.

Use with caution
Elderly, haemorrhagic stroke, high alcohol intake, history of liver disease, hypothyroidism, patients at increased risk of muscle toxicity.

DRUG-DRUG INTERACTIONS	
Ketoconazole, Itraconazole, Erythromycin	Increased plasma concentration of atorvastatin and risk of myotoxicity in frequent

Fibrates	Increased risk of rhabdomyolysis

Common side-effects

Back pain, epistaxis, hyperglycaemia, nasopharyngitis, pharyngeolaryngeal pain.

Storage

Store protected from moisture at a tempreture not exceeding 30°C.

FENOFIBRATE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Hypercholesterolemia, hypertriglyceridemia.

Common available forms

Capsule	Tablets
200 mg	145, 160 and 200 mg

Dose

Oral

Hyperlipidemia:

Adult- By using capsule: Initially 200 mg daily, then increased if necessary to 267 mg. Maximum 200 mg daily with concomitant statin.

By using tablet: 160 mg daily.

Child- 5 mg/kg daily.

When not to be used

Gall bladder disease, pancreatitis, photosensitivity to ketoprofen.

Use with caution

Correct hypothyroidism before initiating treatment.

DRUG-DRUG	INTERACTIONS
Anticoagulants	Increased effect of anticoagulants
Statins	Increased risk of kidney and muscle problems

Common side-effects

Abdominal distension, anorexia, diarrhea, nausea.

Storage

Store protected from light.

13. Dermatological Drugs

13.1 Antibacterial Drugs

SILVER SULFADIAZINE

Risk of neonatal haemolysis and methaemoglobinaemia in third trimester.

Uses

Prophylaxis and treatment of infection in burns.

Common available forms

Cream
1%w/w

Dose

Infection in burns: apply using aseptic technique daily (more frequently if very exudative) whilst there is a possibility of infection, or until healing is complete.

When not to be used

Not recommended in neonates.

Use with caution

G-6-PD deficiency.

Common side-effects

Allergic reactions, argyria (a condition where silver particles accumulate in the skin tissue and make it turn blue), burning, itching, leucopenia, rashes.

Storage

Store protected from light.

13.2 Antifungal Drugs

MICONAZOLE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Fungal skin infection, fungal nail infection.

Common available forms

Cream
15g (2%)

Dose

To the skin

Skin infections: apply twice daily to clean dry lesions, continuing for at least 10 days after the condition has cleared.Nail infections: apply 1 to 2 times daily.

Use with caution

Avoid in acute porphyria, contact with eyes and mucous membranes should be avoided, pregnancy.

Common side-effects

Nausea, rash, vomiting.

Storage

Store protected from light and moisture at a temperature not exceeding 30° C. If it is packed in aluminates, the inner surface of tubes should be coated with suitable lacquer.

13.3 Anti-Inflammatory and Antipruritic Drugs

BETAMETHASONE

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Severe inflammatory skin disorders such as eczemas unresponsive to less potent corticosteroids, psoriasis.

Common available forms

Cream	Ointment
0.1%,	0.1%.

Dose

To the skin

Adult and child: Apply 1 to 2 times daily thinly until improvement occurs, then less frequently.

When not to be used

Acne, perioral dermatitis, potent corticosteroids in widespread plaque psoriasis, rosacea (a long term skin condition characterized by facial redness and superficial dilated blood vessels on facial skin, papules, pustules and swelling), untreated bacterial, fungal or viral skin lesions.

Use with caution

Avoid prolonged use (particularly on the face), cautions applicable to systemic corticosteroids may also apply if absorption occurs following topical and local use, infection, keep away from eyes, use under specialist supervision in psoriasis (can result in rebound relapse, development of generalized pustular psoriasis, and local and systemic toxicity). Use of more than 100 gm per week of 0.1% preparation likely to cause adrenal suppression.

Common side-effects

Exacerbation of local infection, local atrophic changes particularly on the face and in skinfolds, characterized by thinning of the dermis, depigmentation, dilatation of superficial blood vessels and formation of striae, perioral dermatitis, acne at site of application, suppression of the hypothalamic-pituitary-adrenal axis with prolonged or widespread use (particularly under occlusion), subcapsular cataract, osteoporosis, glaucoma, intracranial hypertension, psychic instability.

Storage

Store protected from light.

CALAMINE

Uses

Mild pruritus

Common available forms

Cream	Lotion
1 g	50 and 100 ml (8%)

Dose

Oral

Mild pruritus: apply liberally 3 to 4 times daily.

Storage

For lotion and Cream: Store at a temperature not exceeding 30° C. Do not freeze.

13.4 Scabicides and Pediculicides

BENZYL BENZOATE

Uses

Scabies, head, body and pubic lice, pediculosis.

Common Available Forms

Ointment	Lotion
25% w/w (25g)	100 ml (25% w/v),

Dose

To the skin

Adult- Scabies: apply from neck down at night for 2 nights, on each occasion wash off after at least 24 h.

Pediculosis: apply to affected area and wash off 24 h later, further applications possibly needed after 7 and 14 days.

When not to be used

Irritated skin, neonates, pregnancy.

Use with caution

Avoid contact with eyes and mucous membranes, children (not recommended), do not use on broken or secondarily infected skin, breast-feeding (withhold during treatment), apply below neck only, elderly.

Common side-effects

Burning sensation (especially on genitalia and excoriations), rashes, skin irritation.

Storage

Store protected from light and air in well filled containers.

GAMMA BENZENE HEXACHLORIDE

Not to be used in first three months of pregnancy

Uses

Pediculosis (but use for head lice is restricted by resistance), scabies.

Common Available Forms

Lotion	Ointment	Cream	Shampoo
1%w/v	1%w/w	1%w/w	1%w/v.

Dose

To the skin

For pediculosis: As 1% preparation, apply to scalp and hair (taking care not to enter eyes), it should be massaged for 4 minutes and rinsed thoroughly.

For scabies: Take a proper bath and dry your skin then apply lotion in a thin layer below the neck upto the sole of feet. Leave it for 8-12 hour and then take bath.

When not to be used

Seizure, hypersensitivity, skin inflammation, broken skin, premature infants, breast-feeding, pregnancy.

Use with caution

Seizure disorder, open wound or sores, neonates, infants below 2 years, avoid contact with face, eyes, mucus membranes urethral meatus, psoriasis, elderly.

Common side-effects

Insomnia, paresthesia, giddiness, agranulocytosis, aplastic anaemia, skin irritation, contact dermatitis, ataxia, alopecia, severe neurologic toxicities, symptoms of acute poisoning include nausea, vomiting, tremors, coma, convulsions and respiratory failure. Liver, kidney and myocardial toxicity have been reported.

Storage

Store protected from light.

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14. Disease Modifying Anti-Rheumatic Drugs (DMARDs) and Drugs for Gout

14.1 Disease Modifying Anti Rheumatic Drugs (DMARDs)

CHLOROQUINE

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Rheumatoid arthritis (including juvenile arthritis), malaria.

Common available forms

Tablet	Injection	Suspension
250 and 500 mg	10 and 30 ml (40 mg/ml)	50 mg / mL

Dose

Oral

Acute rheumatoid arthritis including juvenile idiopathic arthritis: 150 mg/day (max. 2.5 mg/kg/day).

When not to be used

Psoriatic arthritis.

Use with caution

Acute porphyrias, elderly, G6PD deficiency, long-term therapy (regular eye examination), may aggravate myasthenia gravis, may aggravate psoriasis, neurological disorders specially epilepsy, severe gastro-intestinal disorders.

DRUG-DRUG	INTERACTIONS
Artemether + Lumefantrine	Increased risk of ventricular arrhythmias.
Carbamazepine	Convulsive threshold occasionally lowered.
Cyclosporine	Increased plasma–cyclosporine concentration (increased risk of toxicity).
Digoxin	Plasma-digoxin concentration increased.
Mefloquine	Increased risk of convulsions.
Phenytoin	Convulsive threshold occasionally lowered.
Valproic acid	Convulsive threshold occasionally lowered.

Common side-effects

Gastro-intestinal disturbances, headache, pruritus, rashes, skin reactions.

Storage

Store protected from light.

METHOTREXATE

Not to be used in women who are or may become pregnant

Uses

Rheumatoid arthritis which has failed to respond to penicillamine or chloroquine,

malignant disease.

Common available forms

Tablet	Injection
2.5, 5.0 and 7.5 mg	25 mg/ml and 100 mg/ml.

Dose

Oral

Severe active rheumatoid arthritis: 7.5 mg once weekly, adjusted according to response (max. weekly dose 20 mg). Intramuscular, subcutaneous or intravenous route in severe attack under expert medical supervision at a dose of 7.5 mg once weekly.

When not to be used

Active infection (in non-malignant conditions), ascites, immunodeficiency syndromes (in non-malignant conditions), significant pleural effusion.

Use with caution

Acute porphyrias, diarrhea, extreme caution in blood disorders, peptic ulceration, photosensitivity, risk of accumulation in pleural effusion or ascites (drain before treatment), ulcerative colitis, ulcerative stomatitis.

DRUG-DRUG INTERACTIONS	
Acetylsalicylic acid	Excretion of methotrexate reduced (increased risk of toxicity)
Amoxycillin	Excretion of methotrexate reduced (increased risk of toxicity)
Ibuprofen	Excretion of methotrexate reduced (increased risk of toxicity)
Nitrous oxide	Antifolate effect of methotrexate increased (avoid concomitant use)
Phenytoin	Reduced absorption of phenytoin, antifolate effect of methotrexate increased
Sulfadoxine + Pyrimethamine	Antifolate effect of methotrexate increased (avoid concomitant use), risk of methotrexate toxicity increased
Sulfamethoxazole + Trimethoprim	Antifolate effect of methotrexate increased (avoid concomitant use), risk of methotrexate toxicity increased

Common side-effects

Blood disorders (bone marrow suppression), liver damage, pulmonary toxicity, gastrointestinal disturbances,kidney failure, skin reactions, alopecia, osteoporosis, arthralgia, myalgia, ocular irritation, precipitation of diabetes.

Blood count, liver enzymes (at least SGPT), kidney fuction tests (at least urinary albumin or serum creatinine) should be tested regularly throughout the period of treatment (at first at monthly intervals for three months, then at three monthly intervals).

Storage

- Tablet: Store protected from light and moisture.
- Injection: store protected from light.\

SULFASALAZINE

Not to be used in first three months of pregnancy

Uses

Severe rheumatoid arthritis, ulcerative colitis, Crohn's disease.

Common available forms

Tablet
500 and 1000 mg Enteric coated

Dose

Oral

Adult: Initially 500 mg daily increase by 500 mg at interval of one week (max. 2 to 3g in divided doses).

Child: 40-50 mg/kg/day.

When not to be used

Child under 2 years of age.

Use with caution

Acute porphyrias, G6PD deficiency, history of allergy, history of asthma, maintain adequate fluid intake, risk of haemato-logical toxicity, risk of hepatic toxicity.

Common side-effects

Blood disorders, cough, dizziness, fever, Heinz body anaemia, insomnia, megaloblastic anaemia, proteinuria, pruritus, stomatitis, taste disturbances, tinnitus.

Blood count, liver enzymes (at least SGPT), kidney fuction tests (at least urinary albumin or serum creatinine) should be tested regularly throughout the period of treatment (at first at monthly intervals for three months, then at three monthly intervals).

Storage

Store protected from light.

14.2 Drugs for Gout

ALLOPURINOL

Use in pregnancy if no safer alternative and disease carries risk for mother or child.

Uses

Prophylaxis of gout, prophylaxis of hyperuricaemia associated with cancer chemotherapy.

Common available forms

Tablet

100, 250 and 300 mg

Dose

Oral

Adult: Initially 100 mg daily after food, thereafter adjust according to uric acid concentration. (Usual maintenance dose in mild conditions: 100 to 200 mg daily, in moderately severe condition: 300 mg daily given in divided doses).

Child: Neoplastic conditions and enzyme disorders: 10 to 20 mg/kg daily (max. 400 mg).

When not to be used

Acute gout, if an acute attack occurs while receiving

allopurinol, continue prophylaxis and treat attack separately.

Use with caution

Ensure adequate fluid intake of 2-3 litres daily. For hyperuricaemia associated with cancer therapy, allopurinol treatment should be started before cancer therapy.

Common side-effects

Gastro-intestinal disorders, rashes.

15. Diuretics

HYDROCHLOROTHIAZIDE

Not to be used in pregnancy

Uses

Oedema, diabetes insipidus, hypertension, heart failure.

Availabillity

Tablet
12.5 and 25 mg

Dose

Oral

Adult - Hypertension: 12.5 to 25 mg daily.

Oedema: initially 25 mg daily on waking up, increased to 50 mg daily if necessary.

Severe oedema in patients unable to tolerate loop diuretics: up to 100 mg either daily or on alternate days (max. 200 mg daily).

Nephrogenic diabetes insipidus: initially up to 100 mg daily.

ElderlyHypertension: initially 12.5 mg daily.

Oedema: initially 12.5 mg daily.

Child- Neoplastic conditions and enzyme disorders: 1 to 2 mg/kg daily (max. 3 mg/kg daily or 100 mg).

When not to be used

Addison's disease, hypercalcaemia, hyponatraemia, refractory hypokalaemia, symptomatic hyperuricaemia.

Use with caution

Diabetes, gout, hyperaldosteronism, malnourishment, nephritic syndrome, systemic lupus erythematosus.

DRUG-DRUG	INTERACTIONS
Amitriptyline	Increased risk of postural hypotension
Artemether + Lumefantrine	Increased risk of ventricular arrhythmias if electrolyte disturbance occurs
Carbamazepine	Increased risk of hyponatraemia
Digoxin	Cardiac toxicity of digoxin increased if hypokalaemia occurs
Glibenclamide	Antagonism of hypoglycaemic effect
Ibuprofen	Risk of nephrotoxicity of ibuprofen increased, antagonism of diuretic effect
Insulins	Antagonism of hypoglycaemic effect
Lithium	Reduced lithium excretion (increased plasma-lithium concentration and risk of toxicity), furosemide safer than hydrochlorothiazide
Salbutamol	Increased risk of hypokalaemia with high doses of salbutamol

Common side-effects

Altered plasma-lipid concentrations, gout, hypercalcaemia, hyperglycaemia, hyperuricaemia, hypochloraemic alkalosis, hypokalaemia, hypomagnesaemia, hyponatraemia, metabolic and electrolyte disturbances, mild gastrointestinal disturbances, postural hypotension.

MANNITOL

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Cerebral edema, raised intraocular pressure (emergency treatment or before surgery).

Common available forms

Infusion

5, 10 and 20%

Dose

Intravenous infusion

Cerebral oedema, raised intra-ocular pressure:Adult-0.25-2 g/ kg, repeated if necessary, to be administered over 30-60 minutes, dose may be repeated 1-2 times after 4-8 hours.

When not to be used

Anuria, intracranial bleeding (except during craniotomy), severe cardiac failure, severe dehydration, severe pulmonary oedema.

Use with caution

Extravasation causes inflammation and thrombophlebitis.

Common side-effects

Electrolyte imbalance, fluid imbalance, hypotension, thrombophlebitis.

Storage

Store at temperatures between 20° and 30°C. Exposure to lower temperatures may cause the deposition of crystals, which should be dissolved by warming before use.

16. Local Anaesthetics

BUPIVACAINE

Use lower doses for intrathecal use during late pregnancy. Large doses during delivery can cause neonatal respiratory depression, hypotonia and bradycardia after epidural block.

Uses

Infiltration anaesthesia, peripheral and sympathetic nerve block, spinal anaesthesia, postoperative pain relief.

Common available forms

Injection

20 ml vial (0.25%, 0.5% and 1%).

Dose

Injection

Adult-Local: Infiltration using 2.5 mg/ml solution (max. 60 ml).

Peripheral nerve block: 2.5 mg/ml solution (max. 20 ml) or 5.0 mg/ml solution (max. 30 ml).

Epidural block: Lubricant surgery 5 mg/ml solution (max. 20 ml).

Sympathetic nerve block: 2.5 mg/ml solution (max. 50 ml).

When not to be used

Application to the middle ear (can cause ototoxicity), avoid injection into infected and inflamed tissues, complete heart block, should not be applied to damaged skin.

Use with caution

Cardiovascular disease, cerebral atheroma, debilitated patients (consider dose reduction), elderly (consider dose reduction), epilepsy, hypertension, hypotension, hypovolaemia, impaired cardiac conduction, impaired respiratory function, myasthenia gravis, myocardial depression, shock.

Common side-effects

Arrythmias, blurred vision, cardiac arrest, convulsions, dizziness, drowsiness, feeling of inebriation, headache, lightheadedness, muscle twitching, myocardial depression, nausea, numbness of tongue and perioral region, paraesthesia, peripheral vasodilatation, restlessness, tinnitus, transient excitation, tremors, vomiting.

Storage

Store in single dose or multi-dose containers preferably of Type-I glass.

LIGNOCAINE

Not to be used in first three months of pregnancy

Uses

Surface anaesthesia of mucous membranes, infiltration anaesthesia, peripheral and sympathetic nerve block, dental anaesthesia, spinal anaesthesia, intravenous regional anaesthesia, arrhythmias.

Common available forms

Injection	Topical	Gel	Spray
30 ml vial (1%) and 10 ml (5%/2 ml) ampoule and 30 ml vial (2%)	30 ml vial (4%), 30 ml vial (lignocaine 20 mg and adrenaline 5 mg/ml)	2% and 4%	15% w/w

Dose

Injection

Induction of anaesthesia: By injection according to patient weight and nature of procedure. (max. 200 mg lignocaine or 500 mg with adrenaline).

Local application: Rub gently on the affected area.

When not to be used

All grades of atrioventricular block, severe myocardial depression, sino-atrial disorders. When used by regional administration: Application to the middle ear (can cause

ototoxicity), avoid injection into infected and inflamed tissues, myocardial depression, should not be applied to damaged skin.

Use with caution

Respiratory impairment, liver impairment, epilepsy, porphyria, myasthenia gravis, avoid (or use with great care) solutions containing adrenaline for ring block of digits or appendages (risk of ischaemic necrosis), breast-feeding, pregnancy, interactions.

Common side-effects

Bradycardia, confusion, convulsions, dizziness, drowsiness, hypotension, paraesthesia, respiratory depression.

Storage

Store in a cool place.

17. Preoperative Medication

ATROPINE

For detailed information, Chapter 7.

DIAZEPAM

For detailed information, Chapter 6

METOCLOPRAMIDE

For detailed information, Chapter 8.

18. Drugs for Inflammatory Bowel Disease

DICYCLOMINE

Not to be used in first three months of pregnancy

Uses

Symptomatic relief of gastro-intestinal disorders characterized by smooth muscle spasm.

Common available forms

Tablet	Drop	Injection
10 and 20 mg	10 mg/ml	10 mg/ml.

Dose

Oral

Child 6 months-1 year: 5-10 mg 3-4 times a day, dose to be taken 15 minutes before feeds.

Child 2-11 years: 10 mg 3 times a day

Child 12-17 years: 10-20 mg 3 times a day

Adult: 10-20 mg 3 times a day.

Parenteral

Adult-80 mg daily in 4 divided doses.

When not to be used

Child under 6 months of age.

Use with caution

Patients with mental depression and mental disturbances, liver or kidney disease, angle closure glaucoma, hyperthyroidism, CHF, elderly, pregnancy, may impair the ability to drive or operate machinery, interactions, pregnancy.

Common side-effects

Dry mouth, nausea, vomiting, constipation, taste loss, anorexia, dizziness, dyskinesia, lethargy, respiratory arrest,

drowsiness, photophobia, blurred vision, increased ocular pressure, tachycardia, urinary retention.

Storage

- Injection: Store protected from light, in single dose or multiple dose containers.
- Tablets: Store protected from light.

19. Drugs for Respiratory Diseases

19.1 Antiasthmatics and Drugs for Chronic Obstructive Pulmonary Disease (COPD)

BECLOMETHASONE

Inhaled drugs for asthma can be taken as normal during pregnancy.

Uses

Prophylaxis of asthma

Common available forms

Metred Dose Inhaler	Rotacaps (powder)
50, 100, 200 and 250 mcg per puff	100, 200 and 400 mcg per capsule, 30 capsules pack.

Dose

Aerosol inhalation

Child 2-11 years: 100-200 mcg twice daily

Child 12-17 years: 200-400 mcg twice daily (maximum 1mg twice daily)

Adult: 200-400 mcg twice daily (maximum 1mg twice daily)

Inhalation of powder

Child 5-11 years: 100-200 mcg twice daily

Child 12-17 years: 200-400 mcg twice daily (maximum 800 mcg twice daily)

Adult: 200-400 mcg twice daily (maximum 800 mcg twice daily)

When not to be used

Respiratory tract infection, pulmonary tuberculosis, ulcer, perioral dermatitis.

Use with caution

Active or quiescent tuberculosis, systemic therapy may be required during periods of stress or when airway obstruction or mucus prevent drug access to smaller airways, not for relief of acute symptoms, monitor height of children receiving prolonged treatment-if growth slowed, review therapy, untreated fungal bacterial and systemic viral infection, breast-feeding, pregnancy.

Common side-effects

Oropharyngeal candidiasis, cough and dysphonia (usually only with high doses), adrenal suppression, growth retardation in children and adolescents, impaired bone metabolism, glaucoma and cataract (with high doses, but less frequent than with systemic corticosteroids), paradoxi- cal bronchospasm-requires discontinuation and alternative therapy (if mild, may be prevented by inhalation of β_2-adrenoceptor agonist or by transfer from aerosol to powder inhalation).

Candidiasis can be reduced by use of a spacing device. Rinsing the mouth with water after inhalation may help to prevent candidiasis.

Storage

Store protected from moisture at a temperature not exceeding 30°C.

BUDESONIDE

Inhaled drugs for asthma can be taken as normal during pregnancy.

Uses

Nasal allergy, prophylaxis and treatment of seasonal and perennial allergic or vasomotor rhinitis, nasal polyposis, asthma.

Common available forms

Inhaler	Rotacap	Nasal spray	Respule
100 and 200 mcg	100, 200 and 400 mcg	50, 64, 100 mcg per puff	0.25, 0.5 and 1 mg per 2 ml.

Dose

Inhaler, Respule, Rotacap, Nasal Spray

Inhalation of nebulised suspension

Child 6 months-11 years: 125-500 mcg twice daily (maximum 2 mg daily)

Child 12-17 years: 0.25-1 mg twice daily (maximum 2mg twice daily)

Adult: 0.25-1 mg twice daily (maximum 2mg twice daily)

Inhalation of powder

Child 6-11 years: 100-200 mcg twice daily

Child 12-17 years: 100-800 mcg twice daily

Adult: 100-800 mcg twice daily

Nasal spray

Nasal polyps and allergic rhinitis: 200-400 mcg/day by intranasal spray.

When not to be used

Hypersensitivity, presence of infections or nasal ulcers.

Use with caution

Paradoxical bronchospasm, children, elderly, pregnancy, breast-feeding, active or quiescent tuberculosis, interactions.

Common side-effects

Inhalation leads to hoarseness of voice, opportunistic fungal infection in oropharynx, respiratory infection, headache.

IPRATROPIUM

Inhaled drugs for asthma can be taken as normal during pregnancy.

Uses

Reversible airway obstruction, particularly in COPD, acute bronchospasm, severe or life-threatening acute asthma.

Common available forms

Metered dose inhaler	Rotacap	Solution for inhalation	Repsule
20 mcg per puff	40 mcg, 30 capsules pack	250 mcg/ ml, 15 ml	500 mcg/ 2 ml

Dose

Oral

Reversible airways obstruction

By inhalation of aerosol

Child 1 month-5 years: 20 mcg 3 times a day

Child 6-11 years: 20-40 mcg 3 times a day

Child 12-17 years: 20-40 mcg 3-4 times a day

Reversible airways obstruction, particularly in COPD

By inhalation of aerosol

Adult: 20-40 mcg 3-4 times a day

By inhalation of nebulised solution

Adult: 250-500 mcg 3-4 times a day

Acute bronchospasm

By inhalation of nebulised solution

Child 1 month-4 years: 125-250 mcg as required, maximum 1 mg per day

Child 6-11 years: 250 mcg as required, maximum 1 mg per day

Child 12-17 years: 500 mcg as required

Adult: 500 mcg as required

Severe or life-threatening acute asthma

By inhalation of nebulised solution

Child 1 month-11 years: 250 mcg every 20-30 minutes for the first 2 hours, then 250 mcg every 4-6 hours as required

Child 12-17 years: 500 mcg every 4-6 hours as required

Adult: 500 mcg every 4-6 hours as required

When not to be used

Glaucoma, hypersensitivity, bladder obstruction, urinary retention.

Use with caution

Bladder outflow obstruction, prostatic hyperplasia, susceptibility to angle-closure glaucoma.

Common side-effects

Constipation, cough, diarrhea, dry mouth, gastro-intestinal motility disorder, headache.

Storage

Store protected from light and moisture.

MONTELUKAST

Avoid in pregnancy unless essential

Uses

Prophylaxis of asthma, symptomatic relief of seasonal allergic rhinitis in patients with asthma

Common available forms

Tablet
4, 5 and 10 mg

Dose

Oral

Child 6 months-5 years: 4 mg once daily, dose to be taken in the evening

Child 6-14 years: 5 mg once daily, dose to be taken in the evening

Child 15-17 years: 10 mg once daily, dose to be taken in the evening

Adult: 10 mg once daily, dose to be taken in the evening

When not to be used

Hypersensitivity.

Use with caution

History of liver disease, pregnancy.

Common side-effects

Abdominal pain, headache, hyperkinesias in young children, thirst.

Storage

Store protected from light and moisture.

SALBUTAMOL

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Prophylaxis and treatment of asthma, premature labour, reversible airway obstruction.

Common available forms

Tablet	Syrup	Rotacap	Inhaler	Repsule	Nebulising solution
2 and 4 mg	2 mg/ 5 ml	100 & 200 mcg	50 & 100 mcg per puff	2.5 mg/ 2.5 ml	5 mg/ 5 ml, 15 ml

Dose

Oral

Adult: Chronic asthma (when inhalation is ineffective): 2 to 4 mg, 3 or 4 times daily, in some patients up to maximum of 8 mg, 3 or 4 times daily.

Child: Chronic asthma (when inhalation is ineffective): under 2 years, 100 µg/kg, 4 times daily. 2 to 6 years, 1 to 2 mg, 3 to 4 times daily.

Aerosol inhalation

Adult: Prophylaxis of exercise-induced bronchospasm: 200 mcg (2 puffs).

Chronic asthma (as adjunct in stepped treatment): 100 to

200 mcg (1 to 2 puffs), up to 3 to 4 times daily.

Child: Prophylaxis of exercise-induced bronchospasm: 100 mcg (1 puff) increased to 200 mcg (2 puffs), if required.

Chronic asthma (as adjunct in stepped treatment): 100 mcg (1 puff) 3 to 4 times daily, increased to 200 mcg (2 puffs) 3 to 4 times daily, if necessary.

Aerosol inhalation and intramuscular or subcutaneous injection

Adult: Relief of acute bronchospasm: 100 to 200 μg (1 to 2 puffs) by aerosol inhalation and 500 μg by intramuscular or subcutaneous injection, repeated every 4 h if necessary.

Child: Relief of acute bronchospasm: 100 μg (1 puff) increased to 200 μg (2 puffs), if necessary.

Inhalation of nebulized solution

Adult: Severe acute asthma or chronic bronchospasm unresponsive to conventional treatment: 2.5 mg repeated up to 4 times daily, may be increased to 5 mg, if necessary- medical assessment should be considered since alternative therapy may be indicated.

Child: Severe acute asthma or chronic bronchospasm unresponsive to conventional treatment, over 18 months: 2.5 mg repeated up to 4 times daily, may be increased to 5 mg, if necessary- medical assessment should be considered since alternative therapy may be indicated.

Under 18 months: clinical efficacy uncertain (transient hypoxaemia may occur-consider oxygen supplementation).

When not to be used

Abruptio placenta, antepartum haemorrhage, cord compression, eclampsia, history of cardiac disease, intra-uterine fetal death, intra-uterine infection, placenta praevia, pulmonary hypertension, severe pre-eclampsia, significant risk factors for myocardial ischaemia, threatened miscarriage.

Use with caution

Mild to moderate pre-eclampsia, suspected cardiovascular disease.

Common side-effects

Arrhythmias, fine tremor (usually hands), palpitations, tachycardia.

Storage

Store protected from light and moisture at temperature not exceeding 30° C.

THEOPHYLLINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Chronic asthma including nocturnal asthma, acute severe asthma, apnoea of prematurity.

Common available forms

Tablet	Tablet SR / CR	Injection
100, 200, 250, 300 mg.	200, 400 and 600 mg.	10 ml ampoule (25 mg/ml)

Theophylline tablets are available in combination with etofylline.

Dose

Oral

Adult- Chronic asthma (as tablets): 100 to 200 mg, 3 to 4 times daily after food.

Chronic asthma (as modified-release tablets): 300 to 450 mg every 12 h.

Nocturnal asthma (as modified-release tablets): total daily requirement as single evening dose.

Child- Chronic asthma (as tablets), over 12 years: 100 to 200 mg, 3 to 4 times daily after food.

When not to be used

Porphyria, known hypersensitivity.

Use with caution

Cardiac arrhythmia or other cardiac disease, elderly, epilepsy, fever, hypertension, hyperthyroidism, peptic ulcer, risk of hypokalaemia.

Common side-effects

Arrythmias, CNS stimulation, convulsions, diarrhea, gastric irritation, headache, insomnia, nausea, palpitation, tachycardia, vomiting.

Storage

Store protected from moisture.

20. Hormones, Contraceptives and Related Drugs

20.1 Contraceptives

ETHINYLESTRADIOL + LEVONORGESTREL AND ETHINYLESTRADIOL + NORETHISTERONE

Not to be used in women who are or may become pregnant

Uses

Contraception, menstrual symptoms, endometriosis.

Common available forms

Tablet

Levonorgestrel + Ethinylestradiol 0.15 mg + 0.03 mg, 0.25 mg + 0.05 mg
Levonorgestrel 0.15 mg + Ethinylestradiol 0.03 mg + Ferrous fumarate 60 mg.
Norethisterone + Ethinylestradiol 0.5 mg + 0.03 mg, 1.0 mg + 0.03 mg

Dose

Oral

Adult: Contraception: 1 tablet (pill) daily for 21 days, subsequent courses repeated after 7-day pill -free interval (during which withdrawal bleeding occurs). Each tablet (pill) should be taken at approximately the same time each day, if delayed by longer than 24 hours contraceptive protection may be lost. It is important to bear in mind that the critical time for loss of protection is when a pill is omitted at the beginning or end of a cycle (which lengthens the pill-free interval).

Note: Ethinylestradiol with levonorgestrel and ethinylestradiol with norethisterone are representative combined oral contraceptive preparations. Various combinations can serve as alternatives

When not to be used

Acute porphyrias, gall stones, heart disease associated with pulmonary hypertension or risk of embolus, history during pregnancy of cholestatic jaundice, history during pregnancy of cholestatic pruritus, history of breast cancer, migraine with aura, personal history of arterial or venous thrombosis, sclerosing treatment for varicose veins, severe or multiple risk factors for arterial disease, severe or multiple risk factors for venous thromboembolism, systemic lupus erythematosus, transient cerebral ischaemic attacks without headaches, undiagnosed vaginal bleeding.

Use with Caution

Active trophoblastic disease, Crohn's disease, history of severe depression specially if induced by hormonal contraceptive, hyperprolactinaemia, inflammatory bowel disease, personal or family history of hypertriglyceridaemia, risk factors for arterial disease, risk factors for venous thromboembolism, sickle cell disease, undiagnosed breast mass.

Women taking oral contraceptives may be at increased risk of deep-vein thrombosis during travel involving long periods of immobility (over 5 hours). The risk may be reduced by appropriate exercise during the journey and possibly by wearing elastic hosiery.

Common side-effects

Nausea, vomiting, headache, breast tenderness, increase in body weight, thrombosis, changes in libido, depression, chorea, skin reactions, chloasma, hypertension, impairment of liver function, 'spotting' in early cycles, absence of withdrawal bleeding, breast cancer (small increase in risk of breast cancer during use which reduces during the 10 years after stopping, risk factor seems related to age at which contraceptive is stopped rather than total duration of use, small increase in risk of breast cancer should be weighed against the protective effect against cancers of the ovary and endometrium which persists after stopping), dizziness, stomach upset, bloating, mental and mood changes.

LEVONORGESTREL

Not to be used in women who are or may become pregnant

Uses

Emergency hormonal contraception

Common available forms

Tablet

0.75 and 1.5 mg.

Dose

Oral

Adult: Contraception: 1 tablet ('pill') (30 μg) daily, starting on the first day of the cycle and then continuously.

When not to be used

Progestogen-only oral contraceptives, undiagnosed vaginal bleeding, severe arterial disease, liver tumours, breast cancer, thromboembolic disorders, sickle-cell anaemia, porphyria, after evacuation of hydatidiform mole (until return to normal urine and plasma gonadotrophin values), progestogen-only emergency hormonal contraceptives, severe liver disease.

Use with caution

Possible small increase in risk of breast cancer, cardiac disease, sex-steroid dependent cancer, past ectopic pregnancy, mal-absorption syndrome, ovarian cysts, active liver disease, recurrent cholestatic jaundice, history of jaundice in pregnancy, increase in frequency or severity of headache (discontinue pending investigation), breast-feeding, pregnancy

Common side-effects

Menstrual irregularities (including oligomenorrhoea and menorrhagia), nausea, vomiting, headache, dizziness, breast discomfort, depression, skin disorders, disturbances of appetite, weight increase, change in libido.

20.2 Adrenal Hormones and synthetic Substitutes

DEXAMETHASONE

See chapter 3 on antiallergics

HYDROCORTISONE

See chapter 3 on antiallergics

PREDNISOLONE

See chapter 3 on antiallergics

20.3 Insulin and Other Anti-Diabetic Agents

GLIBENCLAMIDE

Use should usually be avoided in pregnancy because of the risk of neonatal hypoglycaemia.

Uses

Type II diabetes mellitus.

Common available forms

Tablet
2.5 and 5 mg

Dose

Oral

Adult: initially 5 mg once daily with or immediately after breakfast, max. 15 mg daily.

Elderly: 2.5 mg, but it should preferably be avoided, adjusted according to response (max. 15 mg daily).

When not to be used

Acute porphyria

Use with caution

Kidney impairment, liver impairment, elderly, substitute insulin during severe infection, trauma, surgery, interactions, diabetic coma, pregnancy

Common side-effects

Mild and infrequent, including gastrointestinal disturbances and headache, liver disorders, hypersensitivity reactions usually in first 6-8 weeks.

GLIMEPIRIDE

Use should usually be avoided in pregnancy because of the risk of neonatal hypoglycaemia.

Uses

Type II diabetes mellitus.

Common available forms

Tablet

1, 2, 3 and 4 mg

Dose

Oral

Adult: Initially 1 mg, adjusted according to response, then increased in steps of 1 mg every 1-2 weeks, increased to 4 mg daily, dose to be taken shortly before or with first main meal. Maximum dose 6 mg daily.

When not to be used

Hypersensitivity, pregnancy, diabetic ketoacidosis, breast feeding.

Use with caution

Porphyria.

Common side-effects

Hypoglycaemia, hyponatraemia, weight gain.

Storage

Store protected from moisture at temperature not exceeding 30° C.

GLIPIZIDE

Use should usually be avoided in pregnancy because of the risk of neonatal hypoglycaemia.

Uses

Type II diabetes mellitus.

Common available forms

Tablet
5 mg

Dose

Oral

Initially 2.5-5 mg daily, adjusted according to response, dose to be taken shortly before breakfast or lunch. Doses up to 15 mg may be given as a single dose, higher doses to be given in divided doses, maximum 20 mg per day.

When not to be used

Hypersensitivity, type I diabetes mellitus, ketoacidosis with or without coma, severe liver or kidney insufficiency, pregnancy, breast-feeding.

Use with caution

Acute porphyria.

Common side-effects

Photosensitivity, dizziness, drowsiness, hyponatraemia.

Storage

Store protected from moisture.

INSULIN

Insulin requirements may altered during pregnancy and doses should be assessed frequently.

Uses

Diabetes mellitus, diabetic emergencies and at surgery, diabetic ketoacidosis or coma.

Common available forms

Injection

multi-dose vials/prefilled syringes/cartridges) - 40 and 100 IU/ml

Dose

Subcutaneous, intramuscular, intravenous injection or intravenous infusion

Adult and Child: Diabetes mellitus: according to individuals requirement.

Use with caution

Reduce dose in kidney impairment, breast-feedings, interactions, pregnancy.

Common side-effects

Fat hypertrophy at injection site, local reactions at injection site, overdose causes hypoglycaemia, transient oedema.

Storage

Store in multi dose container in a refrigerator (2 to 8° C). It should not be allowed to freeze.

INTERMEDIATE ACTING INSULIN
INSULIN ZINC

Uses

Diabetes mellitus.

Common available forms

Injection

40 and 80 IU/ml.

Dose

Subcutaneous injection

Adult and Child- Diabetes mellitus: according to individuals requirement.

Use with caution

Reduce dose in kidney impairment, breast-feeding.

Common side-effects

Hypoglycaemia in overdose, localized, and rarely, generalized allergic reactions, lipodystrophy at injection site.

Storage

Store in multi dose containers in a refrigerator (2 to 8° C). It should not be allowed to freeze.

ISOPHANE INSULIN

Uses

Diabetes mellitus

Common available forms

Injection

40 and 80 IU/ml.

Dose

Subcutaneous injection

Adult and Child: Diabetes mellitus: according to individual's requirement

Use with caution

Reduce dose in kidney impairment, breast-feeding.

Common side-effects

Hypoglycaemia in overdose, localized and rarely, generalized allergic reactions, lipodystrophy at injection site.

Storage

Store in multi dose containers in a refrigerator (2 to 8°C). It should not be allowed to freeze.

METFORMIN

Not to be used in first three months of pregnancy.

Uses

Diabetes mellitus.

Common available forms

Tablet
500, 850 and 1000 mg

Dose

Oral

Adult- Initially 500 mg with breakfast for at least 1 week, then 500 mg with breakfast and evening meal for at least 1 week, then 500 mg with breakfast, lunch and evening meal or 850 mg every 12h with or after food (max. 2g daily in divided doses).

When not to be used

Ketoacidosis, use of general anaesthesia (suspend metformin on the morning of surgery and restart when renal function returns to baseline).

Use with caution

Measure serum creatinine before treatment and once or twice annually during treatment, substitute insulin during severe infection, trauma, surgery, breast-feeding, interactions, liver or kidney disease, heart disease.

Common side-effects

Abdominal pain, anorexia, diarrhea (usually transient), nausea, taste disturbances, vomiting.

Storage

Store protected from light and moisture.

20.4 Oxytocics and Antioxytocics

Oxytocics

METHYL ERGOMETRINE

Uses

Postpartum haemorrhage caused by uterine atony.

Common Available Forms

Tablet	Injection
0.125 mg	1 ml ampoule (0.2 mg/ml).

Dose

Injection

Adult – 250-500 mcg

When not to be used

Eclampsia, first stage of labour, induction of labour, second stage of labour, sepsis, severe cardiac disease, severe hypertension, vascular disease.

Use with caution

Acute porphyrias, cardiac disease, hypertension, multiple pregnancy, risk of hypertension with intravenous administration.

Common side-effects

Abdominal pain, arrhythmias, bradycardia, chest pain, dizziness, dyspnoea, headache, hypertension, nausea, palpitation, pulmonary oedema, rash, tinnitus, vasoconstriction, vomiting.

Storage

- Tablets: Store protected from light at a temperature not exceeding 30° C.
- Injection: Store protected from light in a single dose container at a temperature not exceeding 30° C.

OXYTOCIN

Uses

Induction of labour, Caesarean section (immediately after delivery), prevention and treatment of postpartum haemorhage, incomplete, inevitable or missed abortion.

Common available forms

Injection
5 IU/ml, 1 ml ampoule

Dose

Intravenous infusion

Adult and adolescent- Induction of labour: initially 0.001

to 0.002 units/min increased in 0.001 to 0.002 units/min increments at intervals of 30 min until a max. of 3 to 4 contractions occur every 10 min, max. recommended rate 0.02 units/min.

Slow intravenous injection

Adult and adolescent- Prevention of postpartum haemorrhage: 5 units when the anterior shoulder is delivered or immediately after birth. Treatment of postpartum haemorrhage: 5-10 units.

Intramuscular injection

Adult and adolescent- Prevention of postpartum haemorrhage: 10 units when the anterior shoulder is delivered or immediately after birth. 10 units, followed in severe cases by slow intravenous infusion, a total of 40 units should be infused at a rate of 0.02-0.04 units/min, this should be started after the placenta is delivered.

Note: The dose shown above is suitable for use in hospital where equipment to control the infusion rate is available, alternative recommendations may be suitable for other settings. Careful monitoring of fetal heart rate and uterine motility essential for dose titration (never give intravenous bolus injection during labour), discontinue immediately in uterine hyperactivity or fetal distress

When not to be used

Any condition where spontaneous labour inadvisable, Any condition where vaginal delivery inadvisable, avoid intravenous injection during labour, avoid prolonged administration in oxytocin-resistant uterine inertia, avoid rapid intravenous injection, fetal distress, hypertonic uterine contractions, severe cardiovascular disease, severe eclamptic toxaemia.

Use with caution

Induction or enhancement of labour in presence of borderline cephalopelvic disproportion (avoid if significant), mild to moderate pregnancy-associated hypertension or cardiac disease, age over 35 years, history

of low-uterine segment caesarean section, avoid tumultuous labour if fetal death or meconium-stained amniotic fluid (risk of amniotic fluid embolism), water intoxication and hyponatraemia (avoid large volume infusions and restrict fluid intake), caudal block anaesthesia (risk of severe hypertension due to enhanced vasopressor effect of sympathomimetics), interactions.

Common side-effects

Arrhythmia, headache, nausea, vomiting.

Storage

Store at a temperature not exceeding 30°C. Do not freeze.

20.5 Thyroid Hormones and Antithyroid Drugs

CARBIMAZOLE

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Thyrotoxicosis, Grave's disease.

Common available forms

Tablet

5, 10 and 20 mg.

Dose

Oral

15 to 40 mg daily continue until the patient becomes euthyroid, usually after 4-8 weeks, higher doses should be prescribed under specialist supervision only, then reduced to 5-15 mg daily, reduce dose gradually, therapy usually iven for 12-18 months.

When not to be used

Severe blood disorders.

Use with caution

Liver disorders, pregnancy, breast-feeding, neutropenia.

Common side-effects

Arthralgia, fever, headache, jaundice, leucopenia, malaise, mild gastro-intestinal disturbances, nausea, pruritus, rash, taste disturbances.

Storage

Store protected from light and moisture at a temperature not exceeding 30° C.

LEVOTHYROXINE

Safe in pregnancy

Uses

Hypothyroidism

Common available forms

Tablet

25, 50, 75, 100, 125 and 150 mcg

Dose

Oral

Hypothyroidism

Adult 18-49 years: Initially 50-100 mcg once daily, adjusted in steps of 25-50 mcg every 3-4 weeks, adjusted according to response, maintenance 100-200 once daily, dose to be taken preferably 30 minutes before breakfast, tea, coffee or other medication.

Adult 18-49 years: Initially 25 mcg once daily, adjusted in steps of 25 mcg every 4 weeks, adjusted according to response, maintenance 50-200 once daily, dose to be taken preferably 30 minutes before breakfast, tea, coffee or other medication.

Congenital hypothyroidism and juvenile myxoedema:

Up to 1 month: initially 5 to 10 mcg/kg daily. Over 1 month: initially 5 mcg/kg daily, adjusted in steps of 25 mcg every 2

to 4 weeks, until mild toxic symptoms appear, then reduce dose slightly.

When not to be used

Thyrotoxicosis

Use with caution

Cardiovascular disorders (myocardial insufficiency or ECG evidence of myocardial infarction), diabetes insipidus, diabetes mellitus (may need to increase dose of insulin or oral antidiabetic drug), elderly, hypertension, long-standing hypothyroidism, myocardial infarction, myocardial insufficiency, panhypopituitarism (initiate corticosteroid therapy before starting levothyroxine), predisposition to adrenal insufficiency (initiate corticosteroid therapy before starting levothyroxine).

Common side-effects

Anginal pain, arrhythmias, diarrhea, excitability, fever, flushing, headache, heat intolerance, hypersensitivity reactions, insomnia, muscle cramp, muscular weakness, oedema, palpitation, pruritus, rash, restlessness, sweating, tachycardia, transient hair loss in children, tremor, vomiting, weight loss.

Storage

Store protected from light and moisture.

21. Immunologicals

TETANUS VACCINE

Uses

Active immunisation against tetanus and neonatal tetanus, wound management

(tetanus-prone wounds and clean wounds).

Common available forms

Injection

0.5 ml ampoule

Dose

Intramuscular injection

Primary immunisation:

3 doses each of 0.5 ml with an interval of 4 weeks between each dose.

Reinforcing immunisation:

2 doses each of 0.5 ml, the first dose, 10 years after completion of primary course and the second dose, after 10 years.

Immunisation of women of child-bearing age against tetanus:

3 primary doses each of 0.5 ml with an interval of not less than 4 weeks between the first and second doses and 6 months between the second and third dose. 2 reinforcing doses each of 0.5 ml, the first dose, 1 year after completion of the primary course and the second dose, 1 year later.

Unimmunised pregnant women:

2 doses each of 0.5 ml with an interval of 4 weeks between each dose (second dose at least 2 weeks before delivery) and 1 dose during each of subsequent 3 pregnancies (max. 5 doses).

When not to be used

Anaphylactic reaction, hypersensitivity.

Use with caution

Mild cold. If schedule requires tetanus vaccine and antitetanus immunoglobulin to be administered at the same time, they should be administered using separate syringes and separate sites, pregnancy.

Common side-effects

Tetanus component rarely, associated with peripheral neuropathy, seizures, neurological disturbance, fever, loss of appetite.

22. Ophthalmological Preparations

22.1 Antiglaucoma Drugs

ACETAZOLAMIDE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

As an adjunct in the treatment of chronic open-angle glaucoma, secondary glaucoma, as part of pre-operative treatment of acute angle-closure glaucoma.

Common available forms

Tablet
250 mg

Dose

Tablet

Adult: 0.25 to 1g daily in divided doses.

When not to be used

Adrenocortical insufficiency, hyperchloraemic acidosis, hypokalaemia, hyponatraemia, long-term administration in chronic angle-closure glaucoma.

Use with caution

Diabetes mellitus, elderly, impaired alveolar ventilation, not generally recommended for long-term use, pulmonary obstruction, renal calculi.

Common side-effects

Ataxia, depression, diarrhea, dizziness, excitement, fatigue, flushing, headache, irritability, loss of appetite, nausea, paraesthesia, polyuria, reduced libido, taste disturbance, thirst, vomiting.

Storage

Store protected from light.

22.2 Anti-Infective Drugs

CHLORAMPHENICOL

Avoid in pregnancy unless essential.

Uses

Superficial eye infections.

Common available forms

Ointment	Drops
1%w/w	0.5% w/v

Dose

To the eye

Eye drop:

Child and adult-Apply 1 drop every 2 hours then reduce frequency as infection is controlled and continue for 48 hours after healing, frequency dependent on the severity of the infection. For less severe infection 3-4 times daily is generally sufficient.

Eye ointment:

Child and adult-Apply daily at night (if eye drops are used during the day), alternatively apply 3-4 times a day if ointment used alone.

When not to be used

Pregnancy, breast-feeding, porphyria, hypersensitivity.

Use with caution

Avoid repeated courses and prolonged treatment, reduce doses in liver impairment, kidney impairment, blood counts required before and periodically during treatment, monitor plasma-chloramphenicol concentration in neonates, interactions:

Common side-effects

Transient stinging.

Storage

Store protected from moisture at a temperature not exceeding 30° C.

CIPROFLOXACIN

Use in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Bacterial infections of eye.

Common available forms

Ointment	Drops
5 g (0.3% w/w),	5 and 10 ml (0.3% w/v).

Dose

Adult and child above 12 years- Instill 2 to 3 drops in affected eye 3 to 4 times daily to start with thereafter reduce slowly as infection subsides. Apply about 0.5 cm ribbon of ointment in lower conjuctival sac for 3 to 4 times daily. Reduce as infection subsides.

When not to be used

Epilepsy and hypersensitivity to quinolones.

Use with caution

It should be used with caution in patients with a history of epilepsy or conditions that predispose to seizures, in G-6-PD deficiency, myasthenia gravis (risk of exacerbation), in kidney impairment, pregnancy, during breast-feeding, and in children or adolescents. Exposure to excessive sunlight should be avoided (discontinue if photosensitivity occurs). Avoid excessive alkalinity of urine and ensure adequate fluid intake (risk of crystalluria), interactions, paediatric use.

Common side-effects

Corneal deposits (reversible after completion of treatment), ocular discomfort, ocular hyperaemia, tatse disturbance.

Storage

- Ointment: Store protected from light at a temperature not exceeding 30p C.
- Drops: Store protected from light.

GENTAMICIN

Use in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Blepharitis, bacterial conjunctivitis, keratitis, corneal ulcers.

Common available forms

Drops
5 ml (0.3% w/v)

Dose

Instillation into the eye

Adult: Mild to moderate infections: 1 drop every 2 h, reducing frequency as infection is controlled, then continue for 48 h after healing is complete.

When not to be used

Hypersensitivity to aminoglycoside group of antibiotics.

Use with caution

Prolonged use may lead to skin sensitization and emergence of resistant organisms including fungi, discontinue if purulent discharge, inflammation or exacerbation of pain, ophthalmic ointment may retard corneal healing, kidney impairment, interactions, pregnancy.

Common side-effects

Burning, stinging, itching, dermatitis, conjuctival epithelial defects,conjuctival hyperemia, thrombocytopenic purpurea, hallucination.

TETRACYCLINE

Use in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Superficial bacterial infection of the eye, mass treatment of trachoma in endemic areas, prophylaxis of neonatal conjunctivitis (ophthalmia neonatorum) due to Neisseria gonorrhoea or Chlamydia trachomatis.

Common Available Forms

Ointment

1% w/w

Dose

Application to the eye

Adult: Superficial bacterial infection: 1 application of ointment, 3 to 4 times daily.

Trachoma, intermittent treatment: 1 application of ointment into each eye either twice daily for 5 days or once daily for 10 days, every month for 6 consecutive months each year, repeated as necessary.

Trachoma, continuous intensive treatment: 1 application of ointment into each eye twice daily for at least 6 weeks.

Child (over 8 years): Superficial bacterial infection: 1 application of ointment 3 to 4 times daily.

Prophylaxis of neonatal conjunctivitis: newborn at birth after cleansing eyes with sterile gauze: 1 application of ointment into each eye, close eyelids and massage gently to aid spread of ointment.

Trachoma, intermittent treatment: 1 application of ointment into each eye either twice daily for 5 days or once daily for 10 days, every month for 6 consecutive months each year, repeated as necessary.

Trachoma, continuous intensive treatment: 1 application of ointment into each eye twice daily for at least 6 weeks.

When not to be used
Hypersensitivity to tetracycline group of antibiotics.

Use with caution
Prolonged use may lead to overgrowth of non-susceptible organisms, breast-feeding, interactions, pregnancy

Common side-effects
Rash, stinging, burning.

Storage
Store protected from moisture at a temperature not exceeding 30°C.

22.3 Anti-Inflammatory Drugs
Ophthalmic corticosteroids should only be used under supervision of an ophthalmologist as inappropriate use may lead to blindness.

PREDNISOLONE
Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus.

Uses
Short-term local treatment of inflammation of the eye.

Common available forms

Drops
5 ml 1% w/v

Dose
Application to the eye

Child and adult- Apply every 1-2 hours until inflammation is controlled, then reduce frequency.

When not to be used
Undiagnosed 'red eye' caused by herpetic keratitis, glaucoma, viral diseases of cornea

and conjunctiva.

Use with caution

Cataract, corneal thinning, corneal or conjunctival infection, discontinue treatment if no improvement within 7 days, risk of adrenal suppression after prolonged use in infants, liver impairment, breast-feeding, interactions, pregnancy.

Common side-effects

Adrenal suppression following prolonged use in neonates, corneal thinning, sclera thinning.

22.4 Mydriatics

PHENYLEPHRINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Hypotension, mydriatic for eye conditions, uveitis, wide angle glaucoma, refraction, ophthalmoscopic examinations.

Common available forms

Drops

5 ml (5% w/v).

Dose

Application to the eye

Instill 3 to 4 drops every 3 to 4 h or as required.

When not to be used

Hypertension, pregnancy, narrow angle glaucoma.

Use with caution

Coronary, mesenteric, or peripheral vascular thrombosis, following myocardial infarction, Prinzmetal's variant angina, hyperthyroidism, diabetes mellitus, hypoxia or hypercapnia, uncorrected hypovolaemia, elderly, infants.

Common side-effects

Headache, hypertension, bradycardia, arrhythmias, peripheral ischaemia.

Storage

Store protected from light.

23. Nasal decongestant

XYLOMETAZOLINE

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Nasal congestion.

Common available forms

Drops

10 and 15 ml (0.05 to 0.1 %w/v).

Dose

To the nose

Instill 1 to 2 drops 1-3 times a day as required.

When not to be used

Narrow angle glaucoma, atrophic rhinitis, vasomotor rhinitis.

Use with caution

Avoid excessive or prolonged use, caution in infants under 3 months, no good evidence of value if irritation occurs, might narrow nasal passage, infants and cardiac patients, pregnancy.

Common side-effects

Local irritation, nausea, headache, after excessive use tolerance with diminished effect, rebound congestion, cardiovascular effects also reported, dryness of eye and nose, rhinitis medicamentose.

Storage

Store protected from light.

24. Psychotherapeutic Drugs

24.1 Antianxiety Agents and Drugs Used In Sleep Disorders

ALPRAZOLAM

Harmful for fetus, may be used in pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Short-term use in anxiety.

Common available forms

Tablet
0.25 and 0.5 mg

Dose

Oral

Adult: 0.25 to 0.5 mg daily 2 to 3 times a day.

Child: Not recommended.

When not to be used

Chronic psychosis, hyperkinesias, not for use alone to treat depression (or anxiety associated with depression), obsessional states, phobic states, respiratory depression.

Use with caution

Muscle weakness, organic brain change, personality disorder may increase risk of dependence.

Common side-effects

Amnesia, ataxia, confusion, dependence, drowsiness the next day, lightheadedness the next day, muscle weakness, paradoxical increase in aggression.

Storage

Store protected from light.

DIAZEPAM

For detailed information, Chapter 7. on antiepileptics

NITRAZEPAM

Harmful for fetus, may be used in Pregnancy in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective.

Uses

Insomnia (short-term use)

Common available forms

Tablet

5 and 10 mg.

Dose

Oral

Adult- 5-10 mg daily at bedtime

Elderly and debilitated- 2.5-5 mg daily at bedtime

When not to be used

Not for use alone to treat chronic psychosis, not for use alone to treat depression (or anxiety associated with depression), respiratory depression.

Use with caution

Acute porphyria, hypoalbuminaemia, marked personality disorder, muscle weakness.

Common side-effects

Amnesia, ataxia, confusion, dependence, drowsiness the next day, lightheadedness the next day, muscle weakness, paradoxical increase in aggression.

Storage

Store protected from light and moisture.

24.2 Antidepressants

AMITRIPTYLINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Moderate to severe depression, migraine prophylaxis, tension headache, enuresis.

Common available forms

Tablet
10, 25, 50 and 75 mg

Dose

Oral

Adult- Initially 75 mg (adolescents 30 to 75 mg) daily in divided doses or as a single dose at bed time increased gradually as necessary to 150 to 200 mg daily.

Child- Under 16 years, not recommended.

Prophylaxis of migraine: 10-75 mg at night.

When not to be used

Acute porphyrias, arrhythmias, during manic phase of bipolar disorder, heart block, immediate recovery period after myocardial infarction.

Use with caution

Cardiovascular disease, chronic constipation, diabetes, epilepsy, history of bipolar disorder, history of psychosis, hyperthyroidism, increased intra-ocular pressure, patients with a significant risk of suicide, phaeochromocytoma, prostatic hypertrophy, susceptibility to angle-closure glaucoma, urinary retention.

Common side-effects

Abdominal pain, fatigue, hypertension, mydriasis, oedema, palpitation, restlessness, stomatitis.

FLUOXETINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Major depression, bulimia nervosa, obsessive compulsive disorder.

Common available forms

Tablet	Capsule
10, 20, 40 and 60 mg	10, 20 and 60 mg.

Dose

Oral

20 mg/day initially (max 60 mg).

When not to be used

Should not be used if the patient enters a manic phase, kidney failure, hypersensitivity.

Use with caution

Should be used with caution in patients with epilepsy (avoid if poorly controlled, discontinue if convulsions develop), cardiac disease, diabetes mellitus, susceptibility to angle-closure glaucoma, a history of mania or bleeding disorders (especially gastro-intestinal bleeding), and if used with other drugs that increase the risk of bleeding, liver impairment, kidney impairment, pregnancy, and breast-feeding. They should also be used with caution in those receiving concurrent electroconvulsive therapy (prolonged seizures reported with fluoxetine). The risk of suicidal behaviour is possibly higher in young adults, calling for close monitoring of those receiving SSRIs. SSRIs may also impair performance of skilled tasks (e.g. driving), interactions.

Common side-effects

Alopecia, changes in blood sugar, chill, confusion, diarrhea, dysphagia, dyspnoea, euphoria, flushing, haemorrhage, hepatitis,hypotension, impaired cocentration, malaise,

palpitation, pharyngitis, priaprism, pulmonary fibrosis, pulmonary inflammation, sleep disturbances, taste disturbance, toxic epidermal necrolysis, urinary frequency, vasodilatation, yawning.

Storage

Store protected from moisture.

24.3 Antipsychotics

CHLORPROMAZINE

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Schizophrenia and other psychotic disorders, mania, psychomotor agitation and violent behaviour, adjunct in severe anxiety, psychosis, mania, hiccups.

Common available forms

Tablet	Syrup	Injection
25, 50 and 100 mg	60 ml (25 mg/5 ml)	2 ml ampoule (25 mg/ml).

Dose

Oral

Adult- Schizophrenia and other psychoses, mania, psychomotor agitation, violent behaviour and severe anxiety (adjuvant): initially 25 mg 3 times daily (or 75 mg at night) adjusted to response to usual maintenance dose of 100-300 mg daily (but up to 1.2g daily may be required in psychosis).

Elderly or debilitated- Schizophrenia and other psychoses, mania, psychomotor agitation, violent behaviour and severe anxiety (adjunct): one-third to one-half adult dose.

Child- Schizophrenia and other psychoses, mania, psychomotor agitation, violent behaviour and severe anxiety (adjunct), (for childhood schizophrenia and autism)

1 to 5 years: 500 μg/kg every 4-6 h (max. 40 mg daily).

6 to 12 years: one-third to one-half adult dose (max. 75 mg daily).

Deep intramuscular injection

Adult- Relief of acute symptoms: 25 to 50 mg every 6 to 8 h.

Child- Relief of acute symptoms: 500 μg/kg every 6 to 8 h (1 to 5 years: max. 40 mg daily.6 to 12 years: max. 75 mg daily).

When not to be used

CNS depression, comatose states, hypothyroidism.

Use with caution

Diabetes.

Common side-effects

Can induce dystonic reactions such as facial and skeletal muscle spasms and oculogyric crises, children are particularly susceptible.

Storage

Store protected from light.

HALOPERIDOL

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Schizophrenia and other psychotic disorders, mania, psychomotor agitation and violent behaviour, adjunct in severe anxiety, agitation, psychosis, neuroleptanalgesia.

Common available forms

Tablet	Syrup	Injection
0.25, 1.5, 5, 10 and 20 mg	30 ml (25 mg/ml),	5 ml ampoule (5 mg/ml).

Dose

Oral

Adult-Schizophrenia and other psychoses, mania,

psychomotor agitation and violent behaviour and severe anxiety (adjuvant): initially 1.5 to 3 mg 2 to 3 times daily or 3 to5 mg 2 to 3 times daily in severely affected or resistant patients (up to 30 mg daily in resistant schizophrenia).

Elderly or debilitated-Schizophrenia and other psychoses, mania, psychomotor agitation and violent behaviour and severe anxiety (adjuvant): initially half adult dose.

Child-Schizophrenia and other psychoses, mania, psychomotor agitation and violent behaviour and severe anxiety (adjuvant): initially 25 to 50 μg/kg daily in 2 divided doses (max. 10 mg daily).

Intramuscular injection

Adult- Acute psychotic conditions: initially 2 to 10 mg, subsequent doses every 4 to 8 h according to response (up to every h if necessary) to max. of 18 mg, severely disturbed patients may require initial dose of up to 18 mg.

Elderly or debilitated- Acute psychotic conditions: initially half adult dose.

Child- Acute psychotic conditions: not recommended.

When not to be used

Bradycardia, children, CNS depression, comatose states, lesions of basal ganglia, Parkinson's disease, phaeochromocytoma, QT-interval prolongation.

Use with caution

Arteriosclerosis, hypocalcaemia, hypokalaemia, hypomagnesaemia, metabolic disturbances, subarachonoid haemorrhage, thyrotoxicosis, when transferring from oral to depot therapy the oral dose should be reduced gradually.

Common side-effects

Depression, weight loss.

Storage

Store protected from light.

OLANZAPINE

Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Schizophrenia, acute mania episodes in bipolar disorder.

Common available forms

Tablet

2.5, 5, 7.5, 10, 15 and 20 mg

Dose

Oral

Schizophrenia: initial 5-10 mg, usual dose is 10-20 mg. Acute maniac episodes in bipolar illness: 10-15 mg/day.

When not to be used

With intra-muscular use—acute myocardial infarction, bradycardia, recent heart surgery, severe hypotension, sick sinus syndrome, unstable angina.

Use with caution

Bone-marrow depression, diabetes mellitus, hypereosinophilic disorders, low leucocyte count, low neutrophil count, myeloproliferative disease, paralytic ileus.

Common side-effects

Arthralgia, hypercholesterolaemia, hypertriglyceridaemia, increased appetite, malaise, oedema.

TRIFLUOPERAZINE

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Schizophrenia, non-psychotic anxiety, acute Psychosis

Common available forms

Tablet	Injection
1, 2, 5 and 10 mg	10 ml ampoule (10 mg/10 ml), 5 ml ampoule (2 mg/ml)

Dose

Oral

Schizophrenia and Psychosis:***Adult and child over 12 years-*** Initially 5 mg twice daily, increase by 5 mg daily to 15-20 mg daily after 1 week and then at intervals of 3 days, according to response.

Elderly- reduce initial dose by atleast half.

Anxiety management: ***Adult-*** 1-2 mg twice daily. Max.- 6 mg daily.

Child- 3 to 5 years, Max.- 1 mg daily in divided doses.

6 to 12 years, Max.- 4 mg daily.

Elderly- reduce initial dose by atleast half.

Antiemetic: 2–4 mg daily in divided doses or as a single dose of a modified-release preparation, max. 6 mg daily.

Child- 3–5 years up to 1 mg daily,

6–12 years up to 4 mg daily.

Deep intramuscular injection

Psychosis:***Adult-*** 1-2 mg by deep i.m injection, repeat every 4-6 h, if necessary.

Child- 1 mg by deep i.m injection, once or twice daily.

When not to be used

CNS depression, comatose states, phaeochromocytoma.

Use with caution

Myasthenia gravis, kidney and liver impairment, benign prostatic hyperplasia, glaucoma, epilepsy, exposure to extreme heat or phosphorous insecticides, peptic ulcer, Parkinson's disease, interactions, pregnancy.

Common side-effects

Anorexia, dystonic reactions, muscle weakness.

Storage

- Injection: Store protected from light.
- Tablets: Store protected from light and moisture.

24.4 DRUGS FOR BIPOLAR DISORDERS

CARBAMAZEPINE

Chapter on antiepileptics in Chapter 5

25. Solutions Correcting Water, Electrolyte and Acid Base Disturbances

25.1 Oral

ORAL REHYDRATION SALT

Refer to Chapter 6 on Laxatives and medicine for Diarrhoea

25.2 Parenteral

GLUCOSE

Uses

Fluid replacement without significant electrolyte deficit, treatment of hypoglycaemia, varicose veins.

Common available forms

Infusion

250 ml, 500 ml and 1L (5% w/v), 500 ml (10% w/v), 500 ml (20% w/v), solution for infusion

Dose

Intravenous infusion

Fluid replacement

Adult and Child- Determined on the basis of clinical and wherever possible, electrolyte monitoring.

Treatment of hypoglycaemia: Infusion of 50% glucose solution into a large vein.

Adult- 25 ml.

When not to be used

Anuria, thiamine deficiency, trauma, intracranial haemorrhage, haemodilution, acute ischaemic shock, hypophosphatemia, sepsis.

Use with caution

Diabetes mellitus (may require additional insulin), monitor fluid balance. Do not give alone except when there is no significant loss of electrolytes, prolonged administration of glucose solution without electrolyte s can cause hyponatraemia and other electrolyte disturbances.

Common side-effects

Glucose injections, especially if hypertonic, may have a low pH and cause venous irritation and thrombophlebitis.

Storage

Store in a single dose container at a temperature not exceeding 30°C.

GLUCOSE + SODIUM CHLORIDE

Uses

Fluid and extracellular volume depletion with excess diuresis, gastroenteritis.

Common available forms

Infusion

250, 450, 500 ml and 1 L. (Dextrose 5% and sodium chloride 0.9%).

Dose

Intravenous infusion

Adult and Child- Fluid replacement: determined on the basis of clinical and wherever possible, electrolyte monitoring.

Use with Caution

Restrict intake in impaired kidney function, cardiac failure, hypertension, peripheral and pulmonary oedema, toxaemia of pregnancy.

Common side-effects

Administration of large doses may give rise to oedema.

Storage

Store in a single dose container at a temperature not exceeding 30°C.

SODIUM CHLORIDE

Uses

Electrolyte and fluid replacement, hyponatremia, diabetic ketoacidosis, leg cramps, poisoning.

Common available forms

Infusion	Nasal solution
250 and 500 ml (0.9% Solution)	5 ml (0.9% w/v)

Dose

Intravenous infusion

Adult and Child- Fluid and electrolyte replacement: determined on the basis of clinical and wherever possible, electrolyte monitoring.

When not to be used

Hypertension, liver cirrhosis, ischaemic heart disease, nephrotic syndrome, congestive heart failure.

Use with Caution

Restrict intake in impaired kidney function, cardiac failure, hypertension, peripheral and pulmonary oedema, toxaemia of pregnancy, interactions.

Side-effects

Administration of large doses may give rise to sodium accumulation and oedema, vomiting, intraocular coagulopathy.

Storage

Store in a single dose container at a temperature not exceeding 30°C.

SODIUM LACTATE

Uses

Perioperative fluid and electrolyte replacement, hypovolaemic shock, metabolic acidosis, peritoneal dialysis.

Common Available Forms

Infusion

250, 500 ml and 1L (1.87% w/v).

Dose

Intravenous infusion

Adult and Child-Fluid and electrolyte replacement or hypovolaemic shock: determined on the basis of clinical and wherever possible, electrolyte monitoring. Common adult dose is 1 to 3 litre/day.

When not to be used

Metabolic or respiratory alkalosis, hypocalcaemia or hypochlorhydria, hypernatremia.

Use with Caution

Restrict intake in impaired kidney function, cardiac failure, hypertension, peripheral and pulmonary oedema, toxaemia of pregnancy, corticosteroid therapy, shock, hypoxemia.

Common side-effects

Excessive administration may cause metabolic alkalosis, administration of large doses may give rise to oedema, tissue necrosis, hypernatremia, hypervolemia, reaction at injection site.

Storage

Store in a single dose container at a temperature not exceeding 30°C.

26. Vitamins, Mineral and Antianaemic Drugs

25.1 Vitamins and Minerals

CALCIUM CARBONATE + VITAMIN D_3

Safe in pregnancy

Uses

Prevention and treatment of osteoporosis and osteomalacia, nutritional supplement.

Common available forms

Tablet	Suspension
Vitamin D3 250 IU + Calcium 500 mg	200 ml (Calcium 100 mg+Vitamin D3 200 IU/5 ml).

Dose

Oral

Adult- Calcium 1000 -1300 mg daily

Vitamin $D_3$200 - 800 IU daily.

When not to be used

Hypersensitivity to any of the components, hypercalcaemia and/or hypercalciuria, nephrolithiasis, hypervitaminosis.

Use with Caution

Kidney impairment, impaired calcium absorption in achlor-hydria, risk of hypercalcaemia and hypercalciuria in hypo-parathyroid patients receiving high doses of vitamin D, interactions

Side-effects

Constipation, flatulence, nausea, abdominal pain and diarrhoea, pruritus, rash and urticaria.

METHYLCOBALAMIN

Safe in Pregnancy

Uses

To prevent neurological disorder in patients with neuropathy due to diabetes, alcohol or other drug induced neuropathies.

Common available forms

Tablet	Injection
500 & 1500 µg	500 µg/ml and 0.2 mg/vial.

Dose

Oral

Initially 1000 µg 3 times a day for 2 weeks, thereafter 1000 µg every 3 months by intramuscular injection in case of pernicious anaemia and other macrocytic anaemia. In case with neurological involvement, initially 1 µg on alternate days. Until no further improvement, thereafter 1000 µg every 2 to 3 months.

Prophylaxis: 1000 µg every 2 to 3 months.

When not to be used

Hypersensitivity

Use with Caution

Allergies, pregnancy

Common side-effects

Itching, anaphylactic shock with parenterals, pulmonary oedema, CHF, polycythemia vera.

Storage

- **Injection:** Store in single-dose or multi-dose container protected from light in a refrigerator (2^0 to 8^0 C). Do not freeze.
- **Tablet:** Store protected from light and moisture.

VITAMIN A

Not to be used in women who are or may become pregnant

Uses

Prevention and treatment of vitamin A deficiency, prevention of complications of measles.

Common available forms

Tablet	Injection
5000 IU	50,000 IU/ml.

Dose

Oral

Adult- Prevention of vitamin A deficiency: 2,00,000 units every 6 months, pregnant woman, max. of 10,000 units daily or max. 25,000 units weekly, mothers, 200,000 units at delivery or within 6 weeks.

Treatment of xerophthalmia (except woman of child-bearing age): 2,00,000 units on diagnosis, repeated next day and then after 2 weeks.

Woman of child-bearing age: 5000 to 10,000 units daily for at least 4 weeks or up to 25000 units weekly.

Child- Prevention of vitamin A deficiency: Infant under 6 months: 50,000 units

6 to 12 months: 100,000 units every 4 to 6 months, preferably at measles vaccination

Over 1year: 200,000 units every 4 to 6 months.

Treatment of xerophthalmia: Infant under 6 months: 50,000 units on diagnosis, repeated next day and then after 2 weeks, 6 to 12 months: 1,00,000 units immediately on diagnosis, repeated next day and then after 2 weeks, Over 1 year: same as adults.

When not to be used

Hypervitaminosis

Use with caution

Pregnancy (teratogenic), breast-feeding.

Common side-effects

No serious or irreversible side-effects in recommended doses, high intake may cause birth defects, transient increased

intracranial pressure in adults or a tense and bulging fontanelle in infants (with high dosage), massive overdose can cause rough skin, dry hair, enlarged liver, raised erythrocyte sedimentation rate, raised serum calcium and raised serum alkaline phosphatase concentrations, hair loss, redness of skin, anorexia, weight loss.

Storage

Store protected from light and moisture.

26.2 Antianaemic Drugs

IRON SALTS

Ferrous Gluconate, Ferrous Sulphate: Safe in Pregnancy

Iron Sucrose, Sodium Ferric Gluconate: Not to be used in first three months of pregnancy

Iron Dextran: Probably harmful for fetus, should be used in pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Iron-deficiency anaemia.

Common Available Forms

Tablet	Capsule	Syrup	Injection
(sugar coated, film coated) Ferrous sulphate 200 mg, Ferrous fumarate 200 mg, Ferrous gluconate 300 mg. (all equivalent to 65 mg elemental iron). In women, folic acid may also be given.	Iron sulfate 60-150 mg (20% Iron), Iron fumarate 200-300 mg (33% Iron)	also available	Iron dextran 50 mg/ml, Iron sucrose 20, 50 and 100 mg/ml, Sodium ferric 12.5 mg/ml.

Dose

Oral

Adult: Iron-deficiency anaemia: elemental iron 100 to 200 mg daily in divided doses.

Prevention of iron deficiency anaemia (in those at particular risk): for woman-elemental iron 60 mg daily.

Child: Under 5 years: elemental iron 2 mg/kg (max. 30 mg) daily. Over 5 years: elemental iron 30 mg daily. Over 5 years: folic acid may also be given.

Parenteral

Total dose (ml) = 0.0442(desired haemoglobin - obseved haemoglobin) x LBW + (0.26 x LBW)

[Note: LBW = Lean Body Weight (Kg)] Total dose may be given in divided doses in a daily or twice weekly basis via IM inj. (into the upper quadrant of the buttock), may also be given intravenously by total-dose infusion or as divided inj. A-Z track technique (displacement of the skin laterally prior to injection) is recommended to avoid injection or leakage into subcutaneous tissue.

When not to be used

Haemosiderosis, haemochromatosis, any form of anaemia not caused by iron deficiency, evidence of iron overload, patients receiving repeated blood transfusions, parenteral iron therapy.

Use with caution

A test dose of 0.5 ml should be given & observe patient for at least 1 hour for signs of hypersensitivity, respiratory distress, tachycardia or back/chest pain, should not be administered for longer than 6 months, pregnancy, peptic ulcer, hypotension, regional enteritis, ulcerative colitis, intestinal strictures, diverticula, interactions.

Common side-effects

Nausea, vomiting, metallic taste, constipation, diarrhoea, dark stools, epigastric pain, gastrointestinal irritation, long-

term or excessive administration may cause haemosiderosis, allergic reaction, back pain, staining of teeth. Parenteral: Pain at injection site, sterile abscess.

Storage

Store protected from light at temperature not exceeding 30°C.

FOLIC ACID

Safe in pregnancy

Uses

Treatment of folate-deficiency megaloblastic anaemia, prevention of neural tube defect in pregnancy.

Common available forms

Tablet
5 mg

Dose

Oral

Adult- Treatment of folate-deficiency, megaloblastic anaemia: 5 mg daily for 4 months (up to 15 mg daily may be necessary in malabsorption states). Prevention of first occurrence of neural tube defect: 400 to 500 µg daily before conception and during the first twelve weeks of pregnancy. Prevention of recurrence of neural tube defect: 5 mg daily (reduced to 4 mg daily, if suitable preparation available) from at least 4 weeks before conception until twelfth week of pregnancy.

When not to be used

Should never be given without vitamin B_{12} in undiagnosed megaloblastic anaemia or other vitamin B_{12} deficiency states because risk of precipitating subacute combined degeneration of the spinal cord, folate-dependent malignant disease.

Use with Caution

Women receiving antiepileptic therapy need counselling

before starting folic acid, pernicious anaemia, folate dependent tumor, interactions, pregnancy.

Common side-effects

Neuropathy, bronchospasm, skin eruption, anorexia, skin rash, status epilepticus.

Storage

Store protected from light.

IRON DEXTRAN

Probably harmful for fetus, should be used in Pregnancy only if the potential benefit justifies the potential risk to the fetus

Uses

Iron deficiency anaemia, prevention of iron deficiency before, during or after pregnancy, to make up iron deficiency after pregnancy and during breast-feeding.

Common available forms

Injection

(iron as iron dextran) 1.5 ml ampoule (50 mg/ml).

Dose

Deep intramuscular injection into the gluteal muscle or slow intravenous injection or intravenous infusion.

Adult- Calculated according to body-weight and iron deficit. While deciding on parenteral therapy, oral therapy should be stopped at least 24 h before. Urine may darken on starting.

Child- Under 14 years: not recommended.

When not to be used

History of allergic disorders including asthma and eczema, infection, active rheumatoid arthritis, liver disease.

Use with caution

Oral iron not to be given until 5 days after last injection, liver impairment, kidney impairment, pregnancy, interact-

ions. Anaphylactic reactions can occur with parenteral iron and a test dose is recommended before each dose, the patient should be carefully observed for 60 min after the first test dose and for 15 min after subsequent test doses (subsequent test doses not necessary for intramuscular administration). Facilities for cardiopulmonary resuscitation must be at hand, risk of allergic reactions increased in immune or inflammatory conditions.

Common side-effects

Less commonly nausea, vomiting, abdominal pain, flushing, dyspnoea, anaphylactic reactions, numbness, cramps, blurred vision, pruritus and rash.

Appendix

Name of the organization Address & Phone no		
Patient ID no	Serial No	Date of attendance
Name of patient		
Address		
Occupation	Educational qualification	Family income
History of the present illness		
History of the past illnesses		
Treatment history		
Family history		
Personal history Sleep Appetite Bowel Bladder Addiction		
Menstrual history	History related to child-bearing	
General examination Weight Height Pulse/min Resp/min BP mm of Hg Temp °C		
Anemia Jaundice Cyanosis Oedema Clubbing		
Neck & other Glands	Neck Veins Scar	Disability, if any
Systemic examination findings		
Investigations advised		
Non-Medicinal & Medicinal Advice		
Signature of the attending physician with registration no & date		

First Aid Kit

You may hope that an emergency never occurs, but if it does you need to be prepared. Part of being prepared is keeping an appropriately stocked and maintained first aid kit. Possession of an adequate first aid kit will equip you to provide emergency assistance if required. First aid kit contents may differ depending on the environment in which it is intended to be used:

Remember the following points in relation to first aid kits

- A first aid kit should be kept at home, at the workplace and in vehicles
- First aid kits should be stored in a cool, clean and dry location that is out of reach of small children.
- A regular check of contents is essential to ensure that the contents are present, within expiry date, and in good condition. Replace missing items or medicines that may have expired no later than every 2 months.
- Make sure that all family members / staff know where the first aid kit is located so that it can be quickly retrieved in an emergency.

Contents of CDMU first aid kit (expanded version)

Item	*Quantity*
Non-drug items	
First aid box, plastic hard-case type with handle	1
Injections box, plastic	1
Notebook, small, hard bound (for list of emergency telephone numbers)*	1
Writing pad*	1
Black ball-point pen*	1
Cotton wool, sterile, 25 g pack	2
Cotton wool, non-sterile, 100 g pack	2
Roller bandage 3"	2
Roller bandage 6"	2
Triangular bandage*	2
Elastic (crepe) bandage 10 cm*	1
Gauze pads, sterile	2

Eye pads, sterile*	2
Adhesive tape 5 cm X 5 m	2
Adhesive plaster, waterproof	5
Surgical gloves, sterile, size 7	2 pairs
Disposable syringe with needle 2 mL	2
Disposable syringe with needle 5 mL	2
Wooden splints, assorted	1 set
Forceps, non-toothed, stainless steel, medium size	1

Drug items

Antiseptic lotion (e.g. Povidone iodine 5%)	100 mL pack X 1
Antiseptic cream (e.g. Framycetin 1%)	20 g tube X 1
Antiseptic eye drop (e.g. Gentamicin 0.3%)	Vial 5 mL
Antiseptic eye ointment (e.g. Tetracycline 1%)	5 g tube X 1
Inj Diclofenac sodium 25 mg / mL*	Amp 3 mL X 2
Inj Adrenaline 1 mg / mL (1 in 1000)	Amp 1 mL X 2
Inj Promethazine 25 mg / mL	Amp 2 mL X 2
Inj Diazepam 5 mg / mL	Amp 2 mL X 2
Inj Atropine 0.6 mg / mL	Amp 1 mL X 4
Inj Scopolamine (Hyoscine butylbromide) 20 mg / mL	Amp 1 mL X 2
Inj Prochlorperazine 12.5 mg / mL*	Amp 1 mL X 1
Inj Lignocaine 1% without adrenaline*	Vial 30 mL
Inj Hydrocortisone sodium hemisuccinate 100 mg (for reconstitution)*	Vial X 1
Water for injection*	Amp 5 mL X 4
Tab Paracetamol 500 mg	Strip of 10 X 2
Tab Diclofenac 50 mg enteric coated	Strip of 10 X 1
Tab Aspirin 300 or 325 mg	Strip of 10 X 1
Tab Antacid chewable	Strip of 10 X 1
Tab Isosorbide dinitrate 5 mg sublingual	Strip of 25 X 1
Tab Cetirizine 10 mg	Strip of 10 X 1
Tab Haloperidol 5 mg*	Strip of 10 X 1
Tab Diazepam 5 mg	Strip of 10 X 1
Tab Domperidone 10 mg	Strip of 10 X 1
Tab Azithromycin 250 mg*	Strip of 6 X 1
Inhalation Salbutamol 100 mcg / puff*	200 metered dose unit X 1
ORS powder as per WHO formula*	Sachets for 1 L X 4

Kits are also available in a scaled-down basic version where the items marked with an asterisk are not included.

Other optional items that may be included on request: soap, safety pins, thermometer, plastic gloves (at least 2 pairs), extra prescription medications as specified.

References:

- The doctors' bag. In; Moulds AJ, Martin PB, Bouchier-Hayes TAI. Emergencies in general practice. 4th ed. Plymouth: Petroc Press, 1999. p. 11-14.
- Indo-German Basic Health Project West Bengal. Essential services package, essential drug lists & equipment lists for basic health care in West Bengal. Department of Health & Family Welfare, Government of West Bengal, 2003.
- American Red Cross Society. Family first aid kit - hard case. Available from URL: http:\\www.redcross.org [Accessed Dec 20, 2005].

Please contact CDMU Head Office for further information

SOME DEFINITIONS

Absorption: the movement of a drug into the bloodstream.

Agonist: is a chemical that binds to a receptor and activates the receptor to produce a biological response.

Antagonist: is a type of receptor ligand or drug that blocks or dampens agonist-mediated responses rather than provoking a biological response itself upon binding to a receptor. They have affinity but no efficacy for their cognate receptors, and binding will disrupt the interaction and inhibit the function of an agonist or inverse agonist at receptors.

Bioavailability (BA): is a subcategory of absorption and is the fraction of an administered dose of unchanged drug that reaches the systemic circulation.

Bioavailability: is a measurement of the rate and extent to which a drug reaches at the site of action.

Biological half-life or **terminal half-life:** is the time it takes for a substance (for example a metabolite, drug, signaling molecule, radioactive nucleide, or other substance) to lose half of its pharmacologic, physiologic, or radiologic activity.

In a medical context, half-life may also describe the time it takes for the blood plasma concentration of a substance to halve (*plasma half-life*) its steady-state.

Cross-resistance: is the tolerance to a usually toxic substance as a result of exposure to a similarly acting substance. It is a phenomenon affecting e.g. pesticides and antibiotics.

Cross-tolerance: a phenomenon that occurs when tolerance to the effects of a certain drug produces tolerance to another drug.

Distribution: a branch of pharmacokinetics which describes the reversible transfer of drug from one location to another within the body.

Drug metabolism: is the process by which the body breaks down and converts medication into active chemical substances.

Drug: broadly defined as any man-made, natural, or endogenous (from within body) molecule which exerts a biochemical and/or physiological effect on the cell, tissue, organ, or organism.

Drug resistance is the reduction in effectiveness of a drug such as an antimicrobial, anthelmintic or an antineoplastic in curing a disease or condition. When the drug is not intended to kill or inhibit a pathogen, then the term is equivalent to *dosage failure* or drug tolerance.

Drug tolerance: is a pharmacological concept describing subjects' reduced reaction to a drug following its repeated use. Increasing its dosage may re-amplify the drug's effects. Drug tolerance is a contributing factor of drug addiction.

Effective dose (ED): is the dose or amount of drug that produces a therapeutic response or desired effect in some fraction of the subjects taking it.

The line between efficacy and toxicity is dependent upon the particular patient, although the dose administered by a physician should fall into the predetermined therapeutic window of the drug.

Efficacy: the maximum response achievable from an applied or dosed agent, for instance, a small molecule drug.

Excretion: any one of a number of processes by which a drug is eliminated from an organism either in an unaltered form (unbound molecules) or modified as a metabolite.

Intrinsic activity: is a relative term that describes a drug's efficacy relative to a drug with the highest observed efficacy.

Median lethal dose, LD_{50} (abbreviation for "lethal dose, 50%"), LC_{50} (lethal concentration, 50%) is a measure of the lethal dose of a toxin, radiation, or pathogen.

LD_{50} figures are frequently used as a general indicator of a substance's acute toxicity. A lower LD_{50} is indicative of increased toxicity.

Molecular binding is an attractive interaction between two molecules that results in a stable association in which the molecules are in close proximity to each other.

Pharmacodynamics: the study of the biochemical and physiologic effects of drugs (especially pharmaceutical drugs).

The effects can include those manifested within animals (including humans), microorganisms, or combinations of organisms (for example, infection).

Pharmacoepidemiology: It is the study of the effects of drugs in large numbers of people.

Pharmacogenetics: is the study of inherited genetic differences in drug metabolic pathways which can affect individual responses to drugs, both in terms of therapeutic effect as well as adverse effects.

Pharmacogenomics: can be defined as the technology that analyzes how the genetic makeup of an individual affects his/her response to drugs.

Pharmacognosy: is a branch of pharmacology dealing especially with the composition, use, and development of medicinal substances of biological origin and especially medicinal substances obtained from plants.

Pharmacokinetics: the study of the bodily absorption, distribution, metabolism, and excretion of drugs.

Pharmacology: the branch of medicine and biology concerned with the study of *drug*.

Plasma protein binding: A drug's efficiency may be affected by the degree to which it binds to the proteins within blood plasma. The less bound a drug is, the more efficiently it can traverse cell membranes or diffuse.

Potency: is a measure of drug activity expressed in terms of the amount required to produce an effect of given intensity.

Receptor: A protein molecule that receives chemical signals from outside a cell. When such chemical signals bind to a receptor, they cause some form of cellular/tissue response, e.g. a change in the electrical activity of a cell.

Systems pharmacology: is the application of systems biology principles to the field of pharmacology.

Tachyphylaxis: (Greek: *tachys*, "rapid", and, *phylaxis*, "protection") is a medical term describing an acute rapid decrease in response to a drug after its administration.

Therapeutic index (TI): (also referred to as therapeutic window or safety window or sometimes as therapeutic ratio) is a comparison of the amount of a therapeutic agent that causes the therapeutic effect to the amount that causes toxicity.

Toxicology: is the study of the adverse effects, molecular targets, and characterization of drugs or any chemical substance in excess (including those beneficial in lower doses).

Volume of distribution: is the theoretical volume that would be necessary to contain the total amount of an administered drug at the same concentration that it is observed in the blood plasma.

Time release technology (also known as sustained-release [SR], extended-release [ER, XR, XL], controlled-release [CR], and other synonyms) is a mechanism used in pill tablets or capsules to dissolve a drug over time in order to be released slower and steadier into the bloodstream while having the advantage of being taken at less frequent intervals than immediate-release (IR) formulations of the same drug.

Common Abbreviations used in medication orders

bid - twice a day
PO - by mouth
qid, Qqds - four times a day
qs - as much as needed, quantity, sufficient
Rx - take, prescription
stat. - immediately, at once
tds, tid - three times a day

Measuring liquid medicine

It's important to measure liquid medicine accurately in order to get the right dose. Liquid medicine sometimes comes with a measuring device like a cup, spoon, or dropper. Be sure to use the right device in order to get the right dose. Check the markings carefully on the measuring device. Most liquid medicine is measured by teaspoon (tsp) or milliliter (mL) or cc.

- 1 mL = 1 cc
- 2.5 mL = 2.5 cc = 1/2 teaspoon (tsp)
- 5 mL = 5 cc = 1 tsp
- 15 mL = 15 cc = 3 tsp = 1 tablespoon (tbl or Tbsp)
- 30 mL = 30 cc = 2 Tbsp = 1 fluid ounce (oz)

Using kitchen silverware instead of a measuring device that comes with a medicine can result in the wrong dosing – too much or too little of the medicine. For example, a large kitchen spoon can hold twice as much liquid as a small kitchen spoon. Use the measuring device provided with the medicine instead of kitchen silverware.

- California State Board of Pharmacy, 1625 N. Market Blvd., Suite N-219, Sacramento, CA 95834

NATIONAL LIST OF ESSENTIAL MEDICINES 2015

Section 1- Anesthetic agents

- Halothane
- Isoflurane
- Ketamine
- Nitrous oxide
- Oxygen
- Propofol
- Sevoflurane
- Thiopentone

1.2 - Local anesthetics

- Bupivacaine
- Lignocaine
- Lignocaine + Adrenaline
- Prilocaine + Lignocaine

1.3-Preoperative medication and sedation for short term procedures

- Atropine
- Glycopyrrolate
- Midazolam
- Morphine

Section 2- Analgesics, antipyretics, non steroidal anti inflammatory medicines, medicines used to treat gout and disease midifying agents used in rheumatoid disorders.

2.1. Non-opioid analgesics, antipyretics and nonsteroidal anti-inflammatory medicines.

- Acetylsalicylic acid
- Diclofenac
- Ibuprofen
- Mefenamic acid
- Paracetamol

2.2-Opioid analgesics

- Fentanyl
- Morphine
- Tramadol

2.3-Medicines used to treat gout

- Allopurinol
- Colchicine

2.4-Disease modifying agents used in rheumatoid disorders.

- Azathioprine
- Hydroxychloroquine
- Leflunomide
- Methotrexate
- Sulfasalazine

Section 3 - Antiallergics and medi-cines used in anaphylaxis.

- Aedrenalin
- Cetirizine
- Chlorpheniramine

- Dexamethasone
- Hydrocortisone
- Pheniramine
- Prednisolone

Section 4 - Antidotes and other substances used in poisoning.

4.1 - Nonspecific

- Activated charcoal

4.2 - Specific

- Atropine
- Calcium gluconate
- Desferrioxamine
- Dimercaprol
- Methylthioninium chloride - Methylene blue
- N-acetylcysteine
- Naloxone
- Neostigmine
- Penicillamine
- Pralidoxime chloride -2-PAM
- Snake venom antiserum
  - Soluble/ liquid polyvalent
  - Lyophilized polyvalent
- Sodium nitrite
- Sodiumthiosulphate

Section 5 - Anticonvulsants/ Antiepileptic

- Carbamazepine
- Clobazam
- Diazepam
- Levetiracetam
- Lorazepam
- Magnesiumsulphate
- Phenobarbitone
- Phenytoin
- Sodium valproate

Section 6 - Anti infection medicines

6.1 - Anthelminthics

6.1.1-Intestinal anthelminthics

- Albendazole
- Mebendazole

6.1.2 - Antifilarial

- Diethylcarbamazine

6.1.3 - Anti-schistosomal and anti-trematodal medicine

- Praziquantel

6.2- Antibacterials

6.2.1 - Beta lactam medicines

- Amoxicillin
- Amoxicillin+Clavulinic acid
- Ampicillin
- Benzathine
- benzylpenicillin
- Benzyl penicillin
- Cefadroxil
- Cefazolin
- Cefixime
- Cefotaxime
- Ceftazidime
- Ceftriaxone
- Cloxacillin
- Piperacillin + Tazobactam

6.2.2 - Other antibacterials

- Azithromycin
- Ciprofloxacin
- Clarithromycin
- Co-trimoxazole
  - [Sulphamethoxazole + Trimethoprim]
- Doxycycline
- Gentamicin
- Metronidazole
- Nitrofurantoin
- Vancommycin

6.2.3 - Antileprosy Medicines
- Clofazimine
- Dapsone
- Rifampicin

6.2.4-Antituberculosis medicines
- Capreomycin
- Cycloserine
- Ethambutol
- Ethionamide
- Isoniazid
- Kanamycin
- Levofloxacin
- Linezolid
- Moxifloxacin
- Para-aminosalicylic acid
- Pyrazinamide
- Rifabutin
- Rifampicin
- Streptomycin

6.3 - Antifungal medicine
- Amphotericin B
  - Amphotericin
  - B) conventional-
- Liposomal Amphotericin B
- Clotrimazole
- Fluconazole
- Griseofulvin
- NYSTATIN

6.4 - Antiviral medicines

6.4.1 - Antiherpes medicines
- Acyclovir

6.4.2 - Anti Cytomegalovirus - CMV- medicines
- Ganciclovir

6.4.3 - Antiretroviral Medicines

6.4.3.1 - Nucleoside reverse transcriptase inhibitors
- Abacavir
- Abacavir + Lamivudine
- Lsmivudine + Nevirapine + Stavdine
- Lamivudine + Zidovudine
- Stavudine + Lamivudine
- Tenofovir + Lamivudine
- Tenofovir + Lamivudine + Efavirenz
- Zidovudine
- Zidovudine + Lamivudine + Nevirapine

6.4.3.2 - Non- nucleoside reverse transcriptase inhibitors
- Efaviranz
- Nevirapine

6.4.3.3. - Integrase inhibitors
- Raltegravir

6.4.3.4 - Protease inhibitors
- Atazanavir + Rironavir
- Darunavir
- Lopinavir + Ritonavir
- Ritonavir

6.4.4 Medicines for hepatitis B and hepatitis C
- Entecavir
- Pegylated interferon alfa 2a
- Pegylated interferon alfa 2b
- Ribavirin
- Sofosbuvir
- Tenofovir

Section 6.5-Antiprotozoal Medicines

6.5.1-Antiamoebic and antigiardiasis medicines
- Diloxanide furoate
- Metronidazole

6.5.2-Antileishmaniasis medicines
- Amphotericin

- Amphotericin - conventional
- Lipid/Liposomal
- Amphotericin B
- Miltefosine
- Paromomycin

6.5.3-Antimalarial medicine

6.5.3.1-For curative treatment

- Artemether + Lumefantrine
- Artesunate
- Artesunate Sulphadoxine -
- Pyrimethamine
- Chloroquine
- Clindamycin
- Primaquine
- Quinine

6.5.3.2-For prophylaxis

- Mefloquine

6.5.4-Antipneumocystosis and antitoxoplasmosis medicines

- Co-trimoxazole [Sulphamethooxazole + Trimethoprim]
- Pentamidine

Section-7- Antimigraine medicines

- Acetylsalicylic acid
- Parecetamol
- Sumatriptan

7.2-For prophylaxis

- Flunarizine
- Propranolol

Section B- Antineoplastic/ immunosuppressives and medicines used in palliative care

8.1-Antineoplastic medicines

- 5-Fluorouracil
- 6-Mercaptopurine
- Actinomycin D
- All-trans retinoic acid
- Arsenic trioxide
- Bleomycin
- Bortezomib
- Calcium folinate
- Capecitabine
- Carboplatin
- Chlorambucil
- Cisplatin
- Cyclophosphamide
- Cytosinearabinoside
- Dacarbazine
- Daunorubicin
- Docetaxel
- Doxorubicin
- Etoposide
- Gefitinib
- Gemcitabine
- Ifosfamide
- Imatinib
- L-Asparaginase
- Metphalan
- Mesna
- Methotrexate
- Oxaliplatin
- Paclitaxel
- Procarbazine
- Rituximab
- Temozolomide
- Thalidomide
- Thastuzumab
- Vinblastine
- Vincristine

8.2-Hormones and antihormones used in cancer therapy

- Bicalutamide
- Letrozole
- Prednisolone

- Tamoxifen

8.3-Immunosuppressive medicine

- Azathioprine
- Cyclosporine
- Mycophenolatemophetil
- Tacrolimus

8.4-Medicines used in Palliative care

- Allopurinol
- Amitriptyline
- Dexamethasone
- Diazepam
- Filgrastim
- Fluoxetine
- Haloperidol
- Lactulose
- Loperamide
- Metoclopramide
- Midazolam
- Morphine
- Ondansetron
- Tramadol
- Zoledronic acid

Section 9-Antiparkinsonism medicines

- Levodopa + Carbidopa
- Trihexyphenidyl

Section 10- Medicines affecting blood

10.1-Antianaemia medicines

- Erythropoietin
- Ferrous salts
- Ferrous salt + Folic acid
- Folic acid
- Hydroxocobalamin
- Hydroxyurea
- Iron sucrose

10.2 - Medicines affecting coagulation

- Enoxaparin
- Heparin
- Phytomenadione - Vitamin K1
- Protamine
- Tranexamic acid
- Warfarin

Section 11 - Blood products and Plasma substitutes

11.1 - Blood and Blood components

All forms of the following as approved by licensing authority are considered as included in NLEM. However, considering the process, technology and other relevant aspect, they should be considered differently for purposes such as procurement policy, pricing etc.

- Fresh frozen plasma
- Platelet rich plasma
- Red blood cells
- Whole blood

11.2 - Plasma substitutes

- Dextran-40

11.3 - Plasma fractions for specific use

In case of coagulation factors and other blood products, irrespective of variation in source, all forms of these products as approved by licensing authority are considered as included in NLEM. However, considering the source, process, technology and other relevant aspects, they should

be considered differently for purposes such as procurement policy, pricing act.

- Congulation factor IX
- Congulation factor VIII
- Cryoprecipitate

Section 12 - Cardiovascular medicines,

12.1 - Medicines used in angina

- Acetylsalicylic acid
- Clopidogrel
- Diltiazem
- Glyceryl trinitrate
- Isosorbide -5 -mononitrate
- Isosorbide dinitrate
- Metoprolol

12.2 - Antiarrhythmic medicines

- Adenosine
- Amiodarone
- Esmolol
- Lignocaine
- Verapamil

12.3 - Antihypertensive medicines

- Amlodipine
- Atenolol
- Enalapril
- Hydrochlorothiazide
- Labetalol
- Methyldipa
- Ramipril
- Sodiumnitroprusside
- Telmisartan

12.4-Medicines used in shock and heart failure

- Digoxin
- Dobutamine
- Dopamine
- Noradrenaline

12.5-Antithrombotic medicine -Cardiovascular/ Cerebro-vascular

12.6-Hpolipidemic medicines

- Atorvastatin

Section 13-Medicines used in dementia

- Donepezil

Section 14-Dermatological medicines (Topical)

14.1-Antifungal medicines

- Clotrimazole

14.2-Antiinfective medicines

- Framycetin
- Fusidic acid
- Methylrosanilinium Chloride [Gentain Violet]
- Povidone iodine
- Silver sulphadiazine

14.3-Antiinflammatory and antipruritic medicines

- Betamethasone
- Calamine

14.4-Medicines affecting skin differentiation and proliferation

- Benzoyl peroxide
- Coal tar
- Podophyllin resin
- Salicylic acid

14.5- Scabicides and pediculicides

- Permethrin

14.6-Miscellaneous

- Glycerin
- White Petrolatum

Section 15- Diagnostic agents

15.1-Ophthalmic medicines

- Fluorescein

- Lignocaine
- Tropicamide

15.2-Radiocontrast media

- Barium sulphate
- Gadobenate
- Iohelox
- Meglumine diatrizoate

Section 16-Dialysis solutions

- Hacmodialysis fluid
- Intraperitoneal
- Dialysis solution

Section 17-Disinfectants and antiseptics

17.1-Antiseptics

- Cetrimide
- Chlorhexidine
- Ethyl alcohol
- (Denatured)
- Hydrogen peroxide
- Methylrosanilinium chloride (Gertain Violet)
- Povidone iodine

17.2-Disinfectants

- Bleaching powder
- Glutaraldehyde
- Potassium
- Permanganate

Section 18-Diuretics

- Furosemide
- Hydrochlorothiazide
- Mannitol
- Spironolactone

Section 19-Ear, nose and throat medicines

- Budesonide
- Ciprofloxacin
- Clotrimazole
- Xylometazoline

Section 20 - Gastrointestinal medicines

20.1-Antiulcer medicines

- Omeprazole
- Pantoprazole
- Ranitidine
- Sucralfate

20.2-Antiemetice

- Domperidone
- Metoclopramide
- Ondansetron

20.3-Anti inflammatory medicines

- 5-aminosalicylic acid

20.4-Antispasmodic medicines

- Dicyclomine
- Hyoscine
- Butythromide

20.5-Laxatives

- Bisacodyl
- Ispaghula
- Lactulose

20.6-Medicines used in diarrhea

- Oral rehydration salts
- Zinc sulphate

20.7-Other medicines

- Somatostatin

Section 21-Hormones, other endocrine, medicines and contraceptives

21.1-Adrenal hormones and synthetic substitutes

- Dexamethasone
- Human chorionic gonadotropin
- Hydrocortissone-
- Methylprednisolone

- Prednisolone

21.2- Contraceptives

21.2.1- Hormonal contraceptives

- Ethinylestradiol + Levonorgestrel
- Ethinylestradiol + Norethisterrone

21.2.2-Intrauterine devices

- Hormone releasing IUD
- IUD containing Copper

21.2.3- Barrier methods

- Condom

21.3-Extrogens

- Ethinylestradiol
- Levonorgestrel

21.4- Medicines used in diabetes mellitus

21.4.1- Insulins and other antidiabetic agents

- Glimepiride
- Insulin (Soluable)
- Intermediate Acting (NPH) Insulin
- Metformin
- Premix Insulin
- 30:70 Injection
- Regular (NPH)

21.4.2- Medicines used to treat hypoglycemia

- Comiphene

21.6-Progestogens

- Medroxyprogesterone-acetate
- Norethisterone

21.7 - Thyroid and antithyroid medicines

- Carbimazole
- Levothyroxine

Section 22- immunological

In case of these biological, irrespective of variation in source, composition and strengths, all the products of the same vaccine/ sera/ immunoglobulin, as approved by licensing authority are considered as included in NLEM. However, considering the source, process, technology and other relevant aspects, different products of the same biological should be considered differently for purposes such as procurement policy, pricing etc.

22.1 - Diagnostic agents

- Tuberculin, Purified Protein derivative

22.2-Sera and immunoglobulin's -Liquid/ Lyophilized-

- Anti-rabies immunoglobulin
- Anti-tetanus immunoglobulin
- Anti-D immunoglobulin
- Diphtheria antitoxin
- Hepatitis B immunoglobulin
- Human normal immunoglobulin
- Snake venom
- Antiserum [Soluble/ liquid polyvalent
- Lyophilized polyvalent

22.3- Vaccines

1. All the vaccines which are under Universal Immunization Programme of India -UIP- will be deemed included in NLEM.

Presently, the UIP has BCG, DPT, OPV, Measles, Hepatitis B, Japanese encephalitis and Pentavalent Vaccines.

2. The new vaccines, which have been approved by national Technical Advisory Group on Immunization - NTAGI- and planned to be given under UIP, will be deemed to be included as and when listed in UIP. These vaccines are inactivated polio vaccine (IPV), Measles Rubella (MR) and Rota virus vaccine.
3. In future, the vaccines which are under consideration, if and when included in UIP, will also be deemed included from the date of inclusion in UIP. These are pneumococcal and HPV vaccines.

- BCG vaccine
- DPT +Hib + Hep B vaccine
- DPT vaccine
- Hepatitis B vaccine
- Japanese Encephalitis vaccine
- Measles vaccine
- Oral poliomyelitis vaccine
- Tetanus toxoid

22.3.2 -For Specific Group of Individuals

- Rabies vaccine

Section 23 - Muscle relaxants and cholinesterase inhibitors

- Atracurium
- Baclofen
- Neostigmine
- Succinylcholine
- Vecuronium

Section 24 - Medicines for neonatal care

- Alprostadil
- Caffeine
- Surfactant

Section 25 - Ophthalmological Medicines

- Acyclovir
- Ciprofloxacin
- Ciprofloxacin
- Gentamicin
- Natamycin
- Providone iodine

25.2- Anti-inflammatory medicine

- Prednisolone

25.3 - Local anesthetics

- Proparacaine

25.4 - Moitics and anti glaucoma medicines

- Acetazolamide
- Pilocarpine
- Timolol

25.5-Mydriatics

- Atropine
- Homatropine
- Phenylephrine
- Tropicamide

25.6- Ophthalmic surgical aids

- Hydroxypropyl methylcellulose

25.7-Miscellaneous

- Carboxymethylcellulose

Section 26 - Oxytocics and Antioxytocics

26.1 - Oxytocies and abortifacient

- Dinoprostone
- Methylergometrine
- Mifepristone
- Misoprostol
- Oxytocin

26.2- Medicines used in pre term labour

- Betamethasone
- Nifedipine

Section 27- Psychotherapeutic Medicines

27.1- Medicines used in psychotic disorders

- Clozapine
- Fltphenazine
- Haloperidol
- Risperidone

27.2- Medicines used in mood disorders.

27.2.1-Medicines used in depressive disorders

- Amitriptyline
- Escitalopram
- Fluoxetine

27.2.2-Medicines used in Bipolar disorders

- Lithium
- Sodium valproate

27.3-Medicines used for Generalized Anxiety and Sleep Disorders

- Clonazepam
- Zolpidem

27.4-Medicines used for Generalized Anxiety and Sleep Disorders

- Clomipramine
- Fluoxetine

Section 28 - Medicines acting on the respiratory tract

28.1-Antiasthmatic medicines

- Budesonide
- Budesonide + Formoterol
- Hydrocortisone
- Ipratropium
- Salbutamol
- Tiotropium

Section 29 - Solutions correcting water, electrolyte disturbances and acid-base disturbances

- Glucose
- Glucose + Sodium chloride
- Oral rehydration salts
- Potassium chloride
- Ringer lactate
- Sodium bicarbonate
- Sodium chloride

29.3-Miscellaneous

- Water for Injection

Section 30-Vitamins and minerals

- Ascorbic acid -Vitamin C-
- Calcium carbonate
- Calcium gluconate
- Cholecalciferol
- Nicotinamide
- Pyridoxine
- Riboflavin
- Thiamine
- Vitamin A

WHO MODEL LIST, 2015

Abacavir + Abacavir + Lamivudine
Acetazolamide
Acetic Acid
Acetylcysteine
Acetylsalicylic Acid
Aciclovir
Albendazole
Alcohol Based Hand Rub
Allopurinol
All-Trans Retinoic Acid (ATRA)
Amidotrizoate
Amikacin
Amiloride
Amiodarone
Amitriptyline
Amlodipine
Amodiaquine
Amoxicillin
Amoxicillin + Clavulanic Acid
Amphotericin B
Ampicillin
Anti-D Immunoglobulin
Antitetanus Immunoglobulin
Antivenom Immunoglobulin
Artemether
Artemether + Lumefantrine
Artesunate
Artesunate + Amodiaquine
Artesunate + Mefloquine
Ascorbic Acid
Asparaginase
Atazanavir
Atracurium
Atropine
Azathioprine
Azithromycin
Barium Sulfate
BCG Vaccine
Beclometasone
Bedaquiline
Bendamustine
Benzathine Benzylpenicillin
Benznidazole
Benzoyl Peroxide
Benzyl Benzoate
Benzylpenicillin
Betamethasone
Bevacizumab
Bicalutamide
Biperiden
Bisoprolol
Bleomycin
Budesonide
Bupivacaine
Caffeine Citrate
Calamine
Calcium
Calcium Folinate
Calcium Gluconate
Capecitabine
Capreomycin
Carbamazepine
Carboplatin
Cefalexin
Cefazolin
Cefixime
Cefotaxime
Ceftazidime
Ceftriaxone
Charcoal, Activated
Chlorambucil
Chloramphenicol
Chlorhexidine
Chlorine Base Compound
Chloroquine
Chloroxylenol
Chlorpromazine

Chlorpromazine
Cholecalciferol
Cholera Vaccine
Ciclosporin
Ciprofloxacin
Cisplatin
Clarithromycin
Clindamycin
Clofazimine
Clomifene
Clomipramine
Clopidogrel
Clotrimazole
Cloxacillin
Clozapine
Coagulation Factor IX
Coagulation Factor VIII
Coal Tar
Codeine
Condoms
Copper-Containing Device
Cyclizine
Cyclophosphamide
Cycloserine
Cytarabine
Dacarbazine
Daclatasvir
Dactinomycin
Dapsone
Darunavir
Dasabuvir
Daunorubicin
Deferoxamine
Delamanid
Desmopressin
Dexamethasone
Dextran 70
Diaphragms
Diazepam
Diethylcarbamazine
Digoxin
Diloxanide
Dimercaprol
Diphtheria Antitoxin
Diphtheria Vaccine
Docetaxel
Docusate Sodium
Dopamine
Doxorubicin
Doxycycline
Efavirenz (EFV Or EFZ)
Efavirenz + Emtricitabine + Tenofovir
Eflornithine
Emtricitabine + Tenofovir
Enalapril
Enoxaparin
Entecavir
Ephedrine
Epinephrine (Adrenaline)
Ergocalciferol
Ergometrine
Erythromycin
Estradiol Cypionate + Medroxyprogesterone Acetate
Ethambutol
Ethambutol + Isoniazid
Ethambutol + Isoniazid + Pyrazinamide + Rifampicin
Ethambutol + Isoniazid + Rifampicin
Ethanol
Ethinylestradiol + Levonorgestrel
Ethinylestradiol + Norethisterone
Ethionamide
Ethosuximide
Etonogestrel-Releasing Implant
Etoposide
Ferrous Salt
Ferrous Salt + Folic Acid

Filgrastim
Fluconazole
Flucytosine
Fludarabine
Fludrocortisone
Fluorescein
Fluorouracil
Fluoxetine
Fluphenazine
Folic Acid
Fomepizole
Fresh Frozen Plasma
Furosemide
Gemcitabine
Gentamicin
Gliclazide
Glucagon
Glucose
Glucose With Sodium Chloride
Glutaral
Glyceryl Trinitrate
Griseofulvin
Haemophilus Influenzae Type B Vaccine
Haloperidol
Halothane
Heparin Sodium
Hepatitis A Vaccine
Hepatitis B Vaccine
HPV Vaccine
Hydralazine
Hydrochlorothiazide
Hydrocortisone
Hydroxocobalamin
Hydroxycarbamide
Hydroxychloroquine
Hyoscine Butylbromide
Hyoscine Hydrobromide
Ibuprofen
Ifosfamide
Imatinib
Imipenem + Cilastatin
Influenza Vaccine
Insulin Injection (Soluble)
Intermediate-Acting Insulin
Intraperitoneal Dialysis Solution (Of Appropriate Composition)
Iodine
Iohexol
Ipratropium Bromide
Irinotecan
Isoflurane
Isoniazid
Isoniazid + Pyrazinamide + Rifampicin
Isoniazid + Rifampicin
Isosorbide Dinitrate
Ivermectin
Japanese Encephalitis Vaccine
Kanamycin
Ketamine
Lactulose
Lamivudine (3TC)
Lamivudine + Nevirapine + Stavudine
Lamivudine + Nevirapine + Zidovudine
Lamivudine + Zidovudine
Latanoprost
Ledipasvir + Sofosbuvir
Leuprorelin
Levamisole
Levodopa + Carbidopa
Levofloxacin
Levonorgestrel
Levonorgestrel-Releasing Implant
Levonorgestrel-Releasing Intrauterine System
Levothyroxine
Lidocaine

Lidocaine + Epinephrine (Adrenaline)
Linezolid
Lithium Carbonate
Loperamide
Lopinavir + Ritonavir (LPV/R)
Loratadine
Lorazepam
Lugol's Solution
Magnesium Sulfate
Mannitol
Measles Vaccine
Mebendazole
Medroxyprogesterone Acetate
Mefloquine
Meglumine Iotroxate
Melarsoprol
Meningococcal Meningitis Vaccine
Mercaptopurine
Mesna
Metformin
Methadone
Methotrexate
Methyldopa
Methylprednisolone
Methylthioninium Chloride (Methylene Blue)
Metoclopramide
Metronidazole
Miconazole
Midazolam
Mifepristone
Miltefosine
Misoprostol
Morphine
Mumps Vaccine
Mupirocin
Naloxone
Neostigmine
Nevirapine (NVP)
Niclosamide
Nicotinamide
Nicotine Replacement Therapy (NRT)
Nifedipine
Nifurtimox
Nitrofurantoin
Nitrous Oxide
Norethisterone Enantate
Normal Immunoglobulin
Nystatin
Ofloxacin
Ombitasvir + Paritaprevir + Ritonavir
Omeprazole
Ondansetron
Oral Rehydration Salts
Oseltamivir
Oxaliplatin
Oxamniquine
Oxygen
Oxytocin
Packed Red Blood Cells
Paclitaxel
P-Aminosalicylic Acid
Pancreatic Enzymes
Paracetamol
Paromomycin
Pegylated Interferon Alfa 2a
Penicillamine
Pentamidine
Permethrin
Pertussis Vaccine
Phenobarbital
Phenoxymethylpenicillin
Phenytoin
Phytomenadione
Pilocarpine
Platelet Concentrates
Pneumococcal Vaccine
Podophyllum Resin

Poliomyelitis Vaccine
Potassium Chloride
Potassium Ferric Hexacyano-Ferrate(II) -2H20 (Prussian Blue)
Potassium Iodide
Potassium Permanganate
Povidone Iodine
Praziquantel
Prednisolone
Primaquine
Procaine Benzylpenicillin
Procarbazine
Progesterone Vaginal Ring
Proguanil
Propofol
Propranolol
Propylthiouracil
Prostaglandin E
Protamine Sulfate
Pyrantel
Pyrazinamide
Pyridostigmine
Pyridoxine
Pyrimethamine
Quinine
Rabies Immunoglobulin
Rabies Vaccine
Ranitidine
Retinol
Ribavirin
Riboflavin
Rifabutin
Rifampicin
Rifapentine
Risperidone
Ritonavir
Rituximab
Rotavirus Vaccine
Rubella Vaccine
Salbutamol
Salicylic Acid
Saquinavir (SQV)
Selenium Sulfide
Senna
Silver Sulfadiazine
Simeprevir
Simvastatin
Sodium Calcium Edetate
Sodium Chloride
Sodium Fluoride
Sodium Hydrogen Carbonate
Sodium Lactate
Sodium Nitrite
Sodium Nitroprusside
Sodium Stibogluconate Or Meglumine Antimoniate
Sodium Thiosulfate
Sofosbuvir
Spectinomycin
Spironolactone
Stavudine (D4t)
Streptokinase
Streptomycin
Succimer
Sulfadiazine
Sulfadoxine + Pyrimethamine
Sulfamethoxazole + Trimethoprim
Sulfasalazine
Suramin Sodium
Surfactant
Suxamethonium
Tamoxifen
Tenofovir Disoproxil Fumarate
Terbinafine
Testosterone
Tetanus Vaccine
Tetracaine
Tetracycline
Thiamine
Thioguanine

Tick-Borne Encephalitis Vaccine
Timolol
Tranexamic Acid
Trastuzumab
Triclabendazole
Trimethoprim
Tropicamide
Tuberculin, Purified Protein Derivative (PPD)
Typhoid Vaccine
Urea
Valganciclovir
Valproic Acid (Sodium Valproate)
Vancomycin
Varicella Vaccine
Vecuronium
Verapamil
Vinblastine
Vincristine
Vinorelbine
Warfarin
Water For Injection
Whole Blood
Xylometazoline
Yellow Fever Vaccine
Zidovudine (ZDV Or AZT)
Zinc Sulfate

Different dosage form - are the means or the form – by which drug molecules are delivered to sites of action within the body

Oral dosage forms
Tablet
- Effervescent tablet
- Buccal tablet
- Sublingual tablet
- Chewable tablet
- Dispersible tablet

Capsule
Lozenge
pastilles
Dental cones
Pills
Granules
Powder for oral use
- Solid dosage forms
- Bulk powders

Liquid preparations
- oral solution
- oral suspension
- syrup
- oral drops
- gargles
- mouthwashes
- elixir
- linctuses

Topical dosage forms
- Ointments
- Creams
- Gels
- Pastes
- Fatty pastes
- Non greasy pastes

Dusting powder
Lotions
Paints
Pressurized dispensers (aerosol sprays)

Rectal dosage forms
- Suppository
- Enema

Vaginal dosage forms
- Peccary

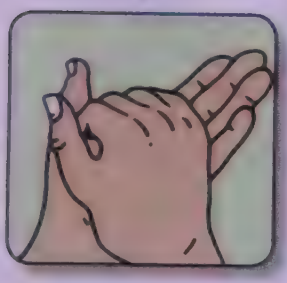
Intramuscular injection
Subcutaneous injection
Inhaled dosage forms
- Inhaler
- Nebulizer or (atomizer)

Ophthalmic dosage forms
- Eye drops
- Ophthalmic ointment and gel

Otic dosage forms
- Ear drops
- Nasal drops and sprats

Steps of Hand-washing

1

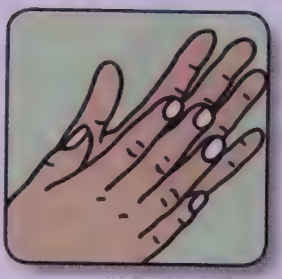


Palm to palm

2

Right palm over left dorsum and left palm over right dorsum

3



Palm to palm, fingers interlaced

4

Backs of fingers to opposing palms with fingers interlocked

5

Rotational rubbing of right thumb clasped in left palm, then vice versa.

6

Rotational rubbing backwards and forwards with clasped fingers of hand in left palm then vice versa.

How to use ear drops properly

1. Wash your hands thoroughly with soap and water

2. Gently clean you rear with a damp facecloth and then dry your ear.

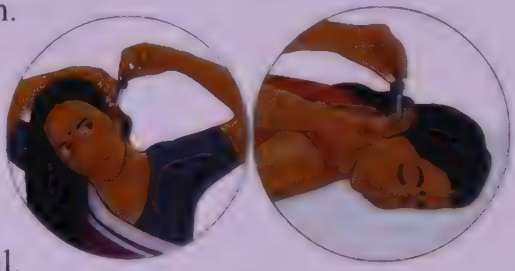
3. Warm the drops to near body temperature by holding the container in the palm of your hand for a few minutes.

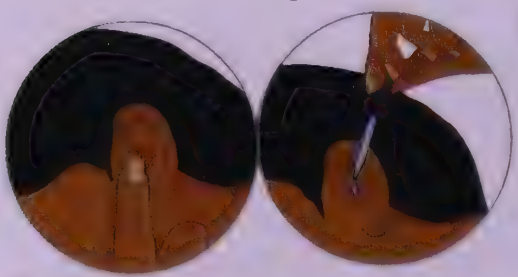
4. If the drops are a cloudy suspension, shake the bottle well for 10 seconds.

5. Check the dropper tip to make sure that it is not chipped or cracked.

6. Draw the medication into the dropper, or hold the dropper-top bottle with the dropper tip down.

7. Tilt the affected ear up or lie on your side. Pull the ear backward and upward (or if giving to a child younger than 3 years of age, pull backward and downward) to open the ear canal.





8. Place the correct number of drops in your ear. Gently press on the small skin flap over the ear to help the drops to run into the canal.

9. Keep your ear titled up for a few minutes or insert a soft cotton plug in your ear, whichever method has been recommended by your pharmacist or doctor.

10. Replace and tighten the cap or dropped right away.

11. Wash your hands to remove any medication

Remember

- Follow directions carefully
- Do not miss doses
- Store medications out of reach of children

How to use eye drops properly

1. Wash your hands thoroughly with soap and water

2. Check the dropper tip to make sure that it is chipped or cracked.
3. Avoid touching the dropper tip against your eye or anything else – eye drops and droppers must be kept clean.

4. While tilting your head back, pull down the lower lid of your eye with your index finger to form a pocket clean.

5. Hold the dropper (tip down) with the other hand, as close to the eye as possible without touching it.
6. Brace the remaining fingers of that hand against your face.

7. While looking up, gently squeeze the dropper so that a single drop falls into the pocket made by the lower eye lid. Remove your index finger from the lower eye lid.

8. Close your eye for 2 to 3 minutes and tip your head down as through looking at the floor. Try not to blink or squeeze your eye lids.
9. Place a finger on the tear duct and apply gently pressure.
10. Wipe any excess liquid from your face with a tissue.
11. If you are to use more than one drop the same eye, wait at least 5 minutes before instilling the next drop.
12. Replace and tighten the cap on the dropper bottle. Do not wipe or rinse the dropper tip.

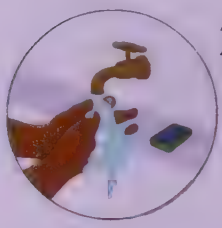
13. Wash your hands to remove any medications.

Remember

- Follow directions carefully
- Do not miss doses
- Use the exact number of drops recommended
- Store medications out of reach of children

How to use nose drops properly

1. Blow your nose gently.

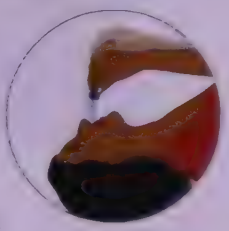


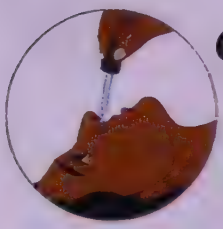
2. Wash your hands thoroughly with soap and water.

3. Check the dropper tip to make sure that it is not chipped or cracked.

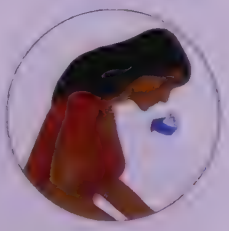
4. Avoid touching the dropper tip against your clean nose.

5. Tilt your head as far back as possible, or lie down on your back on a flat surface -such as a bed- and hang your head over the edge.





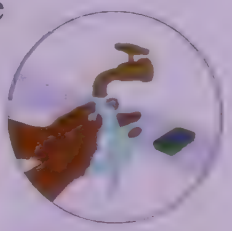
6. Place the correct number of drops into your nose.



7. Bend your head forward your knees and gently move it left and right.

8. Remain in this position for a few minutes.

9. Clean the dropper tip with warm water. Cap the bottle right away.

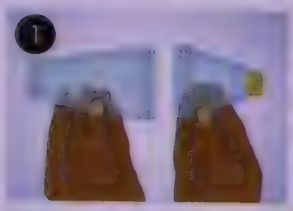


10. Wash your hands to remove any medication.

Remember

- Follow directions carefully
- Do not miss doses
- Use nose drops only as long as directly
- Store medications out of reach of children

How to use Spacer



To assemble the Spacer, firmly push the two halves of the spacer together and rotate. The spacer comes with two locks which ensure proper assembling of the two halves. Make sure that the mouthpiece is closed with the cap.

Remove the cap from the mouthpiece of the inhaler. shake the inhaler well.

Insert the inhaler firmly into the opposite end of the spacer

Holding the inhaler, press down on the canister to release a dose into the spacer. You will see the dose released in the spacer.

"Breathe out fully, through the mouth. Immediately remove the mouthpiece cap from the spacer and then close the lips firmly around the mouthpiece to create a good seal (do not bite it). Breathe in slowly and deeply through the mouth, thus inhaling the medicine through the spacer.

Remove the spacer from the mouth and hold the breath for about 10 seconds, or as long as is comfortable. Breathe out normally. If a second dose is required, wait for a minute, repeat steps 2 to 5.

REMEMBER

- Clean the spacer atleast once a week. Separate the two halves of the spacer by gently rotating and pulling them apart. Rinse both halves in clean water and then shake to remove excess water. Leave it to air dry.
- Ensure that spacer is completely dry at all times.
- Do not clean with boiling or hot water as this will damage the spacer
- Children should use the spacer under parental guidance.
- It is recommended that the spacer should be replaced with a new one after 6 months of use.

How to use metered-dose Inhalers

There are many different types of inhalers available if you are using a different type of inhaler, such as a dry powder in haler or breathe (activated inhaler) a type of inhaler that releases the medication automatically when you breathe in-, you will need to follow different directions. Ask your doctor or pharmacist if you need more information or if you do not know what type of inhaler you are using.

1. Wash your hands thoroughly with soap and warm water.

2. Remove the cap and hold the inhaler upright.

3. Shake the inhaler.

4. Breathe out slowly through your mouth.

5. Hold your inhaler a shown in the recommended by your doctor.

6. While you are breathing in, press down on your inhaler one timer to release the medication.

7. Continue to breathe in slowly and in deeply as you can.

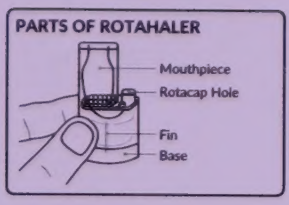
8. Hold your breath for 10 seconds, if you can, to allow the medication to reach deeply into your lungs.

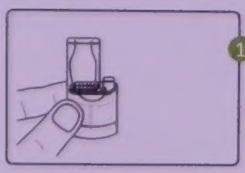
9. Repeat steps 3 to 8 until you have inhaled the number of puffs that your doctor or prescribed. Ask your doctor or pharmacist if you need to wait between puffs of your medication.

10. Rinse your mouth thoroughly with water.

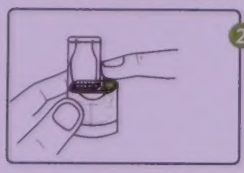
11. Spit out the water. Do not swallow.

How to use Rotahaler

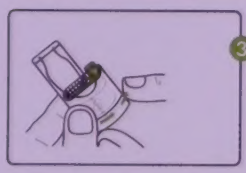




1. Position the two halves of the Rotahaler such that the fin is not directly below the Rotacap hole.



2. Insert the rotacap (Capsule) into the Rotacap hole with the transparent end facing down as shown. Press the Rotacap firmly so that the top end is level with the top of the Rotacap hole.



3. Holding the mouthpiece firmly with one hand, rotate the base. The fin separates the two halves of the Rotacap. The Rotahaler is now ready for use.

4. **Breathe out fully**, through the mouth. Place the mouthpiece between the teeth and close the lips tightly around it. Sit or stand upright, tilt the head as shown and **breathe in through the mouth rapidly and deeply.** Remove the Rotahaler from the mouth and hold the breath for about 10 seconds or for so as long as it is comfortable. Breathe out normally.

In case some powder remains in the Rotahaler, repeat step 4. Ensure that no powder remains in the Rotahaler.

If you need to take a second Rotacap, insert a new Rotacap as shown in step 2. This will push out the empty Rotacap remaining in the Rotacap hole. Proceed with steps 3 and 4.

5. After use, separate the two halves of the Rotahaler and discard the empty Rotacap(s). Rejoin the two halves of the Rotahaler.

REMEMBER

- Clean the Rotahaler at least once a weekto ensure smooth functioning Rinse the two halves of the Rotahaler in clean running water, shake well to remove excess water and leave it to air dry.
- Keep the Rotahaler clean and dry at all times. Never use the Rotahaler when it is wet.
- It is recommended to use a new Rotahaler every 6 months.
- At times a fine layer of powder may remain in the empty Rotacap after use. This is normal and does not alter the effect of the medicine.
- Keep the Rotacap bottle tightly closed to avoid exposure to moisture